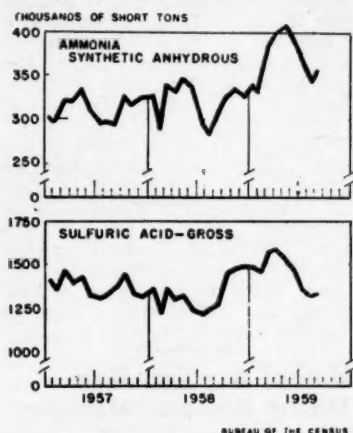


## Monthly Inorganic Chemical Production Registers Rise

### USDC Output Figures Show Increases of Anhydrous Ammonia

WASHINGTON — The September 1959 production levels for industrially important inorganic chemicals in the U.S. were in some cases lower than August, 1959, but higher for the most part than those noted for September



a year ago, reported the Bureau of the Census, U.S. Department of Commerce.

Production of synthetic anhydrous ammonia amounted to 358,981 short tons for September, 1959, which was 16,347 short tons more than August, 1959 production and 53,739 short tons more than September, 1958 output.

(Turn to PRODUCTION, page 21)

## 1960 Pesticide, Fertilizer Sales Look Good, Commerce Report Says

WASHINGTON—A promising outlook for both pesticides and fertilizers is seen for 1960 by the U.S. Department of Commerce in its Business and Defense Services Administration report issued Dec. 11. Over-all prospects for the chemical industry are favorable, the report said, with total sales reaching a possible \$27 billion, which would be an increase of 9% over 1959 figures.

At least part of the prosperity predicted for the pesticide industry, it

says, is based on plans of the International Cooperation Administration to procure some 60 million pounds of 75% DDT and 100,000 lb. 75% diel-drin for use in the malaria eradication program.

Copper sulfate producers are optimistic about the Latin American market for 1960, and producers of cotton pesticides foresee another good year in the offing. The U.S. Department of Agriculture has announced that the national allotment for cot-

ton will be at about 16 million acres, a favorable indication so far as cotton insecticides are concerned.

The fertilizer industry likewise is viewing 1960 with optimism and expects it to be at least as good as was 1959. However, the decline in farm income noted in 1959 may have a depressing effect on fertilizer sales in some areas next season.

The Commerce report says that a shortage of phosphoric acid and ammonium sulfate seems likely to develop by the spring peak of 1960. Likewise, a shortage of coke-oven ammonium sulfate may stem from the 1959 steel strike which prevented suppliers from building up their normal stocks.

Looking at the chemical industry as a whole, the 1960 season appears to be promising. The expected 9% increase in sales may result from extra demand for all types of chemicals by the growing economy. These greater sales should likewise increase production, with inventories remaining within normal levels. Employment in the chemical industry probably will increase only slightly and prices are not expected to rise materially. The recent rapid increases in capacities of large volume chemicals may be reflected in profit margins, the report explains.

Sulfuric acid was among the specific products mentioned in the Commerce report. Output of the acid may exceed 18 million tons, about 4% over 1959, it says. "Competition in the domestic sulfur market will be extremely keen between producers and im-

(Turn to 1960 OUTLOOK, page 17)

### 'Calm Scientific Approach'

## USDA Recommendation for Weed Control Research Follows FDA Cranberry Incident

By JOHN CIPPERLY  
Croplife Washington Correspondent

WASHINGTON—Generally well in advance of producer and industry needs, USDA last week announced a recommendation of basic and applied research on weed control. This recommendation includes activities in legumes, grasses and vegetables grown for seed.

Such weed control activities, according to the USDA seed research and marketing committee, should be aimed at development of chemical, cultural, mechanical and combinations of all to permit increased mechanization of production as well as increase in the quality and quantity of seed crops. Among the studies the USDA seed committee recommended

are those of preplanting, pre-emergence, and post-emergence chemical treatments and rotational use of herbicides combined with cultural crop-competition and crop rotation methods.

This announcement is most interesting since it follows the previous sensational activities of Arthur S. Flemming, secretary of health, education and welfare, in connection with the use of a weed killer in cranberry production, wherein the secretary smeared the entire cranberry industry with little less than a blanket indictment for some alleged misuse of a weed killer.

As usual, USDA control officials

(Turn to CIPPERLY, page 21)

### Understanding Each Other's Problems . . .

## Control Officials and the Local Industry

By Robert Z. Rollins  
Chief, Bureau of Chemistry  
California Department of Agriculture

IN DISCUSSING the relation of the state regulatory office to the local fertilizer industry, it is important to keep in mind that this article describes the situation in California, which may or may not be entirely similar to conditions in other states.

California law defines five classes of fertilizing materials. Briefly, they are as follows:

1. Commercial fertilizers are the usual materials containing 5% or more of nitrogen, available phosphoric acid, and of potash.
2. Agricultural minerals are substances such as lime, gypsum, sulfur, copper, zinc, iron, and manganese compounds.
3. Auxiliary plant chemicals are a diverse group of such products as rooting hormones, stop-drop

chemicals, and legume bacterial inoculants; and include a number of the materials that the Federal Insecticide, Fungicide and Rodenticide Act now includes under the term "plant regulators."

4. Manures are the excreta of domestic animals.

5. Soil amendments include peat, leaf mold, and similar materials commonly sold more for their physical qualities than for their chemical components.

The law establishes different requirements of registration, licensing, labeling, and sale for the first three classes of material. Registration and labeling are not required for the last two.

Samples are drawn from all of these materials found offered for sale. A report showing the guaranteed and the found percentages and any other significant findings is mailed to

the firm and to any dealer and purchaser interested in the sampled lot. At the end of the calendar year, all analytical findings are summarized in a publication for general distribution.

Tonnage license taxes are collected quarterly and the segregated tonnage data collected in this manner are summarized and published each quarter. In addition, the tonnage data are developed and presented in various ways in the annual publication of analytical findings.

### Registration

California law requires separate registration of the name and composition of each agricultural mineral, each auxiliary plant chemical, and each commercial fertilizer sold under a brand name. However, if a firm intends to sell a number of commercial fertilizers under a brand, the law permits registration only of the brand without restriction as to compositions of the separate mixtures. Of course the labeling of each lot must show the

customary guaranteed analysis of that particular lot.

A brand or brand name registered by one firm is not registered for another without authorization by the firm with the prior registration. This has the effect of affording a definite protection of names, more than is afforded by ordinary trademark registration. A file of names is maintained and industry makes frequent use of it by requesting comments on names under preliminary consideration for marketing.

Registration procedure is simplified for both industry and the Bureau by a system of sending registrants a form at the end of each fiscal year that merely needs a signature to renew registration. Supplemental products may be registered at any time.

Relations between the Bureau and the industry concerning registration

(Turn to CONTROLS, page 3)



T. P. Finn

Francis A. Pastor

### Crag Agricultural Chemicals Announces Two Promotions

NEW YORK—Promotion of T. P. Finn to eastern regional sales manager, Crag Agricultural Chemicals, and Francis A. Pastor to product manager, Crag Glyodin, has been announced by Union Carbide Chemicals Co., Division of Union Carbide Corp.

From his headquarters at Rockford, Mich., Mr. Finn will supervise the field service and sales activities for Carbide's line of Crag Agricultural Chemicals throughout the Northeastern, Middle Atlantic, and Midwestern states. He will concentrate on sales of Crag Glyodin fruit fungicide, and the new broad-spectrum insecticide, Sevin.

Mr. Pastor, with headquarters at the company offices in New York City, will be responsible for marketing and distribution of Glyodin, a leading fungicide applied by orchardists on apples, peaches, and cherries. In his new post, he will coordinate both technical and sales development activities for this product.

### Delaware Holds Annual Short Course

DOVER, DEL.—Fertilizer was the theme of the crops and soils short course held here recently. The program opened with Prof. L. J. Cotnoir, agronomist at the University of Delaware, discussing cover crops and the part that weeds play in maintaining organic matter.

James R. Miller, extension agronomist at the University of Maryland, spoke about nitrogen top dressing of small grain. Dr. W. V. Bartholomew, agronomist at North Carolina State University and nationally known authority on urea, explained some of the advantages and disadvantages of using it as a source of nitrogen.

Dr. S. E. Younts, of the American Potash Institute, discussed the possibilities of higher crop yields in Delaware, and Prof. J. D. Burns, University of Tennessee, and James Turner, U.S. Potash Co., teamed up to explain the values of field testing.

The final short course speaker was Dr. J. O. Rowell, Virginia Polytechnic Institute, who discussed alfalfa weevil control and the possibilities of mixing insecticide with fertilizer.

Louis H. Wilson, director of information, National Plant Food Institute, spoke on "Better Public Relations for Agriculture" at the evening banquet, marking the 51st annual meeting of the state crop improvement group.

"Too many American farmers are in the consumer's doghouse," he declared. "The American farmer is a greatly misunderstood man. He has a good story to tell and the story needs telling."

"The farm worker has increased his production 115% in the last 19 years," Mr. Wilson said.

Quoting a Midwestern dean of agriculture, Mr. Wilson said: "Not only do we get our foodstuffs in America with much less time spent earning it, but we eat more and better foodstuffs than ever before in our history. We're all eating higher on the hog and enjoying it tremendously. And it doesn't cost us very much to do either. The thing that bothers most of us in America today is not so much the cost of eating as it is the high cost of living."

## USDA Dedicates New Southern Piedmont Laboratory Building, Facilities in Georgia

WASHINGTON—The U.S. Department of Agriculture announced the dedication of a new laboratory building and facilities at the Southern Piedmont field station, a soil and water conservation center at Watkinsville, Ga.

The new \$550,000 facilities make the station one of the largest and best-equipped installations of its kind in the Southeast, USDA said.

Designed for cooperative federal-state study of soil and water management problems characteristic of the humid southeastern states and the improvement of conservation farming, the laboratory was dedicated in special ceremonies Dec. 4. The Southern Piedmont Station is part of USDA's Agricultural Research Service and is operated in cooperation with the Georgia Agricultural Experiment Station.

Featured speakers at the dedication were: Sen. Richard B. Russell of Georgia; George H. King, director of the Georgia Agricultural Experiment Station; and Dr. M. R. Clarkson, associate administrator of ARS.

The Southern Piedmont Station was first established in 1937 as a regional research center. Research results from the station are directly applicable to soils found in the Southern Piedmont region—an area including portions of Alabama, Georgia, and North and South Carolina—and are

basic enough to be applied to all soil and water conservation problems peculiar to the Southeast.

Among the special features of the enlarged laboratory is a high-light-intensity growth chamber, capable of producing 8- to 10-thousand-foot candles of illumination. This will permit scientists, for the first time, to duplicate the high-intensity sunlight of the area in order to determine its effects upon soil structure, plant growth, and on moisture loss through transpiration and evaporation.

### Six Personnel Changes Announced by IMC

SKOKIE, ILL.—The plant food division of International Minerals & Chemical Corp. has announced six personnel changes in sales and production in its Woburn, Mass., and Cincinnati, Ohio, districts according to John D. Zigler, division general manager.

James E. Sovocool, a sales representative in Buffalo, N.Y., since joining IMC in 1955, has been promoted to district sales manager at Woburn. He succeeds F. R. Witham, who has been named northeast sales manager for specialty products. Mr. Witham joined the company in 1924.

In Cincinnati, G. James Leonhardt, sales supervisor at Chicago Heights, Ill., has been promoted to district sales manager at Cincinnati. He started with IMC in 1953 as a sales representative in Michigan and Illinois. He is a graduate of the college of agriculture at Michigan State University.

John L. Medbery, assistant superintendent at the IMC fertilizer and sulfuric acid plants at Lockland (suburban Cincinnati), has been promoted to superintendent. He joined the company at Mason City, Iowa, as a production trainee, and was transferred to Lockland in 1954. He succeeds C. A. Willenbrink, scheduled for retirement in 1960, who will handle special assignments in the Lockland area office.

Robert L. Wright has been named area credit manager for the sales districts at Greeneville and Lockland. Formerly in the sales department, Mr. Wright has been with IMC since 1937.

William J. Boston, general foreman at Lockland since 1956, has moved up to assistant superintendent. Mr. Boston was formerly at IMC plants in Tupelo, Miss., and East Point, Ga.

### SOUTHERN FARM FORUM

NEW ORLEANS, LA.—Improved marketing of Southern farm products will be featured at the 13th annual Southern Farm Forum at the Roosevelt Hotel here Jan. 21-22.

## INSECTS UNHARMED BY COSMIC RAYS

WASHINGTON—In experiments preliminary to manned space flights, no genetic damage to insects has been observed from cosmic radiation that penetrated U.S. Navy balloon gondolas in which the insects were carried nearly 15 miles above the earth, the U.S. Department of Agriculture reported.

Fruit flies, house flies, and fleas, carried by the balloons remained at altitudes of 78,000 to 82,000 ft. for 16 hours under cosmic ray attack 60 times more intense than at sea level.

This attack, which did not harm the insects genetically, amounted to an impact on living tissue of as much as 10,000 roentgens for less than a millionth of a second. Results of the experiments, however, do not prove that cosmic rays at such altitudes are harmless to life.

The fruit flies used in this experiment by USDA's Agricultural Research Service scientists, had been bred in laboratories to develop marker genes on the X-chromosome (sex-determining chromosome). Because the genetic make-up of this insect is better known than that of most other insects, mutations of specific characters can be easily observed.

In this study, fruit flies returned from the balloon flights, and similar flies kept on the ground for controls, were examined by Dr. Sarah B. Pipkin of Howard University, Washington, D.C. No indication of X-chromosome breakage was found among exposed larvae although the experiment had been designed to reveal such breakage. Furthermore, no increase in gross abnormalities was found in exposed larvae as compared to the controls.

## Columbia-Southern Chemical Names Potato Consultant

PITTSBURGH—Columbia-Southern Chemical Corp. has announced the appointment of Dr. Richard L. Sawyer of Cornell University as a consultant for the firm's program on the development and application of Chloro IPC for sprout inhibition of potatoes.



Dr. R. L. Sawyer

An associate professor in the department of vegetable crops at Cornell, Dr. Sawyer has gained nationwide recognition for his experience in conducting his program on sprout control of potatoes at Cornell. In his new capacity with Columbia-Southern, Dr. Sawyer will be associated with experimental and extension workers of the states developing the application of Chloro IPC under storage conditions which are peculiar to each of the different potato producing areas. Dr. Sawyer will take a six-month leave of absence from Cornell.

### Third Annual Arizona Fertilizer Meeting Planned

TUCSON, ARIZ.—The third annual Arizona Fertilizer Conference will be held at the University of Arizona here on Jan. 20-21, it was announced.

Included on the two-day program will be discussions on: "Latest Developments in Field Crop Fertilizer Research," "Cotton Fertilization Planning from Grower's Viewpoint," "Production Aspect of Cotton in Arizona," "Activities of Other Agencies Concerned with Soil Fertility," "Latest Developments in Fertilization of Vegetables and Fruit Crops in Arizona," "Fertilizer Formulation and Control," a panel on "Basis for Fertilizer Recommendations on Arizona Crops" and a discussion of fertilizer industry research needs in Arizona.

### Hooker Appoints New Market Research Manager

NIAGARA FALLS, N.Y.—Joseph E. Thornberg has been appointed to the newly created position of manager—market research, in the sales department of the Eastern Chemical Division, Hooker Chemical Corp., according to an announcement by Charles Y. Cain, division sales manager.

The Eastern Chemical division, with headquarters at Niagara Falls, has sales offices in Buffalo, Chicago, Detroit, New York, Philadelphia and Worcester, Mass. Manufacturing plants of the division are located in Niagara Falls; Montague, Mich., and Columbus, Miss.

### Vulcan Containers Names New Sales Manager

BELLWOOD, ILL.—Eugene W. Gehm, 43, a veteran of 13 years with Vulcan Containers, Inc., manufacturer



E. W. Gehm

of steel drums and pails, has been named sales manager of the company, Vern I. McCarthy, Jr., president, has announced. In his new capacity, Mr. Gehm will be responsible for the direction of Vulcan sales activities throughout the country, Mr. McCarthy said. Prior to this appointment, Mr. Gehm was assistant sales manager.

The 43-year-old company serves the chemical, petroleum and food fields as well as a number of others. Its products include a wide range of steel shipping pails, drums and tins, plate cans ranging in size from one ounce to 55 gallons.



## CONTROLS

(Continued from page 1)

may involve three questions of interpretation: What is the name? Is it a brand or a brand name? Is it misleading?

By the time a printer or commercial artist has finished designing a fertilizer tag or bag, it is not always easy to decide what the name of the product is, or to distinguish it from other legends, descriptive terms, or ornamentation in which it is submerged. Some firms rearrange terms or add or remove parts of names when printing new bags or when preparing advertisements and the resultant confusion is the cause of much discussion and correspondence.

Insofar as possible, the parts of the name of a product should be in similar size and style of type, always used in the same order and not confusingly combined with other modifying terms. For example, if a firm registers one composition with the brand name "Bluestar Fertilizer," it should not permit bags to show such variations as "Special Bluestar Fertilizer Mixture," "Special Bluestar Garden Fertilizer," or "Bluestar Supreme Fertilizer." If it intends to sell a number of mixes under a name, it may register a brand such as "Bluestar Fertilizers" or "Bluestar Brand," instead of a series of brand names.

It is difficult to summarize the distinction between brands and brand names that has been maintained without getting into a confusion of detail. California law states that a brand is a commercial term under which a series of different fertilizing materials may be sold. A brand name refers to a coined or specific designation applied to an individual fertilizing material of a fixed composition and derivation. The distinction is based on the thought that some names suggest merely a line of materials and the customer expects different lots to show different guarantees. These are brands. On the contrary, some names suggest a unique and fixed composition. These are brand names and the composition of each is registered to keep it unchanged.

The third aspect of registration—whether a name is misrepresentative—rarely concerns the customary agricultural fertilizers but sometimes arises in marketing products widely advertised for the small-package trade; for example, when the name "XYZ Brand Bat Guano Fertilizer" is used to describe a liquid mixed fertilizer that contains an extract of bat guano as a minor one of several constituents.

### Sampling

Samples are drawn from materials found in the channels of trade throughout the State. About 7% of the samples are from supplies ready for distribution but still in the hands of the registered firm, about 25% are from supplies in the hands of dealers, and about 68% are from supplies delivered to farmers but still intact and unopened. Each sampling point has advantages and disadvantages.

Discussions between the Bureau and industry on sampling commonly concern the question of when a firm is responsible for the labeling and the material. It is becoming increasingly difficult to sample some liquid materials which are being delivered by tank trucks directly into storage tanks owned by the purchaser. While the truck is enroute, the firm may maintain that the material will be properly labeled only at the moment of delivery. After it is delivered, the firm may disclaim responsibility because the material was delivered into a farmer's tank containing a remnant of another liquid fertilizer. In some cases it is necessary for the inspector to be present at the time of delivery to secure a valid sample.

The basic intensity of sampling is determined largely by staff and lab-

oratory facilities. In recent years a sample of commercial fertilizer has been analyzed for each 300 to 400 gross tons sold in California. The average for all states is approximately one sample for every 384 tons. Some states analyze a sample for every 100 tons and some analyze only one sample for every 1,000 tons sold.

The decision of what to sample is left largely to the discretion of field inspectors who know best what is moving in their districts. They are kept informed about the current analytical record of the various firms and of the various kinds of materials in their areas. During the latter part of a sampling year, the tonnages reported to date by various firms are compared with the number and compliance of samples drawn and analyzed, and recommendations are made that more or fewer samples be taken from products of certain firms.

In general, it seems desirable to secure the same proportionate "tons per sample" from various firms, modified by consideration of how certain materials and certain firms have been meeting guarantees. An effective sampling program pays proportionately more attention to those materials and those firms that need special attention.

The official sampling procedure itself, which is described in a regulation following A.O.A.C. studies, is seldom a matter of discussion between the Bureau and industry. However, we often find that control samples drawn by firms to check production are carefully drawn from many places in large stock piles and then blended and reduced several times to provide one analysis to represent the huge pile or the day's production. Such blending of portions perhaps gives a good picture of the entire production but it conceals the lot-to-lot variations revealed by official sampling.

### Analysis and Reports

A report of analysis, showing the guaranteed percentages, the findings, and the decision, is mailed to the registrant of the material sampled and a copy is mailed to any dealer or purchaser known to be interested in the particular lot.

A few firms have arranged for our laboratory to send them a portion of every sample found to be deficient and they keep us informed of their findings. Others request portions of samples only occasionally. Only a few of the larger firms in California have their own analytical laboratories. Most of them use the services of

commercial laboratories, of which there are some 40 to 50 in the state.

Relatively few discussions surround actual analytical matters. Perhaps this is due in part to the formal nature of the analytical methods established and kept current by the A.O.A.C. The only opportunity for question is the possibility of gross error and this is guarded against by a fixed policy of rechecking all analyses before reporting a deficiency.

The Magruder sample program sponsored by the National Plant Food Institute is providing control laboratories, industrial laboratories, and commercial laboratories an excellent opportunity for self-appraisal and improvement. It may also serve to increase confidence in analytical findings.

At the end of the calendar year, all analytical findings are summarized in an annual publication available for free distribution. As printing costs increase each year, some consideration must be given to the amount of detail that should be presented and the actual value of such publications.

### Number and Nature of Deficiencies

Over the past 35 years in California between 10% and 29% of all samples of commercial fertilizer have been found to be deficient each year. In recent years the percentage has ranged between 15% to 18%.

It is difficult to compare the performance of firms in various states because laws differ so much in what is recorded as a deficiency.

**Products are not reported deficient in California unless the shortage exceeds the legal tolerances established in the law, which are nitrogen .25%, available phosphoric acid 1%, and potash .50%.**

Most of the deficiencies occur in mixed goods and relatively few are found in simple fertilizer materials. Last year in California, 63% of all deficiencies were found in dry mixtures and 30% in liquids. More than half of the deficiencies occur in nitrogen, about one-third occur in potash, and fewest in phosphoric acid, which is in the order of the tolerances allowed for the three plant foods. In California, the picture is complicated by the fact that the law requires separate guarantees for nitric, ammoniac, and organic nitrogen, and some of the deficiencies are only in one form of nitrogen and not in the total nitrogen guaranteed. Most of the deficiencies of nitrogen lie within 1% of the guaranteed figure and the deficiencies of available phosphoric acid and potash lie within 1.5% of the guaranteed figure.

Much time has been spent investi-

## NEEDED—RAIN

**SACRAMENTO**—Above-average temperatures and clear skies holding no promise of rain are producing increasingly worse prospects for many California ranchers and grain growers.

The north coast of California is the only area offering native forage for livestock. Hay is being shipped to other sections of the state from Oregon and Nevada for stock feeding purposes.

Prospects for late winter and spring rangeland, the most important for most range operators, are growing worse as early germinated plants die and additional seed remains dormant.

Some seeding of barley, wheat, oats and vetch has been carried out but many growers are waiting for rain. Grain crops seeded on dryland are badly in need of moisture for germination and growth.

Irrigated winter wheat crops are doing well. Routine land preparation continues at full speed despite the dry weather.

gating the number and nature of the deficiencies to determine the reason for them and how the record might best be improved.

It is evident that a definite attempt has been made by manufacturers as a whole to produce mixtures which not only conform to guarantee, but which exceed guarantee for total nitrogen by .19%. Although 28% of all the samples were found to contain less nitrogen than guaranteed, 66% of them contained more than the guaranteed amount. Similarly, there was an average of .23% for available phosphoric acid and .29% for potash. Thus, in spite of the large number of deficiencies, the industry as a whole actually delivered to users more plant foods than was guaranteed on the tags.

Of course delivery to one user of an excess amount of plant foods does not justify nor compensate for a deficiency in a delivery made to another user, but the data clearly show that the large number of deficiencies is not the result of an intent to defraud, but due to inadequate uniformity in mixtures.

The separate records of individual firms reveal an excellent picture of the performance of different registrants. Two characteristics of the record of a registrant stand forth clearly—his over-all average and how much above or below the mean his product ranges. The first suggests his intentions and the second describes his performance.

If the average analysis of a registrant's mixed fertilizers is below guarantee, he is obviously not adding enough plant foods to his mixes. If it is above guarantee, he is trying to deliver full value. Most of them are above.

The second characteristic, the dispersion of the various deviations from the mean deviation, shows how well the registrant was able to realize his intention. If the first characteristic shows his aim, the second shows his marksmanship. The charts for some registrants show a compact arrangement of analyses closely grouped about the average deviation; the charts for other registrants show the deviations widely scattered. The standard deviation of the found percentages from their own mean provides a convenient index for comparison of firms.

All the analyses of the products of some registrants are grouped within a range of 1%, those of other registrants are scattered over a range of 5%. It is obvious that registrants differ not only in the overages supplied but in the degree of control they exercise over their manufacturing processes.

How does a firm achieve a good  
(Turn to CONTROLS, page 4)



**READERSHIP AWARD**—An award for top readership for fertilizer advertising in farm papers was recently made to Spencer Chemical Co. by "The Farmer" magazine as a result of Spencer's advertising performance in the publication over a 10-year period, 1950 through 1959. A Readex survey showed four out of the top five fertilizer advertisements appearing in "The Farmer" during that period, were from Spencer. Above, Bert Lund, advertising manager of "The Farmer" presents the award to Byron Kern, vice president, agricultural chemicals, of Spencer. Others in the picture, left to right, are: Richard W. Dodderidge, Spencer account executive with Bruce B. Brewer and Co., and M. H. Straight, Spencer advertising director.



# They all picked

All these famous firms have one thing in common: They operate Union I & C Baggers. And their number is increasing each year. Two I & C users now operate 68 machines. Another recently converted twelve of its plants to I & C Baggers. Hundreds of units have been installed throughout industry—in the last four years alone!

This trend to Union's I & C Bagger began almost as soon as the unit was introduced. The first completely automatic pre-weighing machine for open mouth bags, Union's I & C Bagger made possible great savings for the farm, food and chemical product industries—savings in increased production and reduced

labor, and savings through the use of a lower cost bag. And the I & C was the first machine designed specifically for ease of installation—featuring lower head room and requiring floor space of only 5' x 5'.

Regardless of the size of their operation, manufacturers and processors immediately found that Union's I & C Bagger was a practical, profitable investment. The trend began . . . and still continues. Though much imitated, Union's I & C Bagger is still specified time after time by leading packers of free-flowing materials.

Like these firms, you'll find that the savings achieved with Union's I & C Bagger will pay



Logos and brands included in the collage:

- OCHO-A 8A MARCA
- NOM
- MINERALS International CHEMICALS
- SUPERIOR
- SACCO
- Stokely's Finest
- W.R. GRACE & CO. DAVISON CHEMICAL DIVISION
- Longhorn Construction Co.
- RYAN STEVEDORING COMPANY, INC.
- GULF
- BONE DRY FERTILIZERS
- Farmers Fertilizer Company
- Swift
- T-V CO-OP
- CHAMPION
- SMITH'S FISH MEAL
- SD SMITH-DOUGLASS FERTILIZERS
- Chilean NITRATE
- AA QUALITY
- WALSH STEVEDORING COMPANY
- Corenco QUALITY
- Dixie
- Mutual FERTILIZER CO.
- PELHAM PHOSPHATE COMPANY
- INSULAR FEED CORP.
- TYLER GRAIN & FERTILIZER CO.
- WILMINGTON FERTILIZER CO.
- KINGOVALL KOVA QUALITY
- Producers Quality
- PLANTERS CORRECT PLANT FOOD
- QUALITY FARM BUREAU
- GEORGIA ACE FERTILIZER
- PIONEER
- RED CORN QUALITY FEED
- PIONEER DAIRY FEEDS

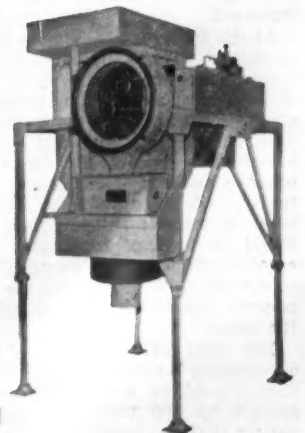
# Union's I&C Bagger!

for its cost in a remarkably short time.

## Service within hours

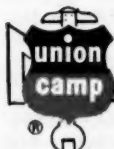
Every I & C Bagger installation is backed up by Union's staff of field service experts—

geographically located to give you the fastest possible service. There's always a Union representative available for consultation on bagging methods and equipment. Write for full details.



## UNION's I&C BAGGER

Automatic weighing and filling machine for open mouth bags.  
Manufactured by Inglett & Company, Inc., Augusta, Georgia.



Exclusive Sales Agents:

**UNION BAG-CAMP PAPER CORPORATION**

Package Engineering Department, 233 Broadway, New York 7, New York

## CONTROLS

(Continued from page 3)

record? To illustrate this, the standing of 30 major manufacturers of dry mixed fertilizers were arranged in accordance with their performance as judged by the percentage of lots found deficient in one year. Deviations from guarantees for the three plant foods and the net deviation for all three together were calculated, and it was found that these firms delivered approximately 1% more plant food than guaranteed. Surprisingly enough, there is no correlation between the percentage of deficiencies for a firm and the net overage found in its mixtures. The firm with the worst record of deficiencies actually gave away more plant foods than all, except one other firm. It is evident that firms develop good records of performance and avoid violative deficiencies more by increased control than by increasing overages.

### Causes of Deficiencies

Examination of these two characteristics—the mean deviation and the dispersion—of the performance of an individual registrant with an unsatisfactory record of deficiencies may indicate the cause of the deficiencies and suggest a remedy. In most cases the charts for registrants with poor records show the analyses average more than guarantee, but the individual analyses are scattered widely above and below this figure. It is evident that most violations are due to carelessness or inadequate manufacturing control inasmuch as the analyses are just as likely to be high as low, and the firm has delivered more plant food than it has guaranteed. In general, such a study indicates the firm's intentions were good but the performance was not.

The use of high analysis components and the scarcity of natural organics which serve somewhat as binders and reduce segregation have been said to have complicated the problems of the mixers. The record indicates that the problem today is no better nor worse than it was in earlier years.

One of the first reports of the regulatory office in California in 1905 described segregation as a serious problem. Trying to mix materials of different densities or to mix fine material with coarse pelleted material is somewhat the same as trying to secure a uniform mixture of walnuts and buckshot. Apparently much of the segregation takes place during mixing and handling as well as during shipping.

The problem of segregation has been carefully studied by individual mixers. In some cases it has been found that the practice of stock piling and curing gives a much more uniform mixture than sacking the material directly from a mixer. Several years ago it was thought that granulation or pelleting would provide a solution to the problem, but apparently it has not done so for some manufacturers.

At the invitation, and with the cooperation of the individual registrants, investigation has been made of the operations of some firms with good records and some with poor records. Errors in calculating formulas have been discovered, scales and other apparatus have been found faulty, and other steps in manufacture of mixed fertilizers have been found in need of correction. Some errors have been traced to faulty assumptions with regard to the components purchased for preparation of the mixes.

The composition of some of these components is subject to variation and they should be analyzed frequently enough by the registrant to make certain that he can depend upon them to contribute the proper amount of plant foods to the mix. It was also discovered that individual bags of these materials varied as much as 10% from the weight guaranteed, and

manufacturers cannot always depend upon the net contents stated on the bag in formulating mixtures.

### Actions on Deficiencies

It has become customary for registrants, upon receiving a report on a deficient sample, to refund a proportionate part of the sales price to the purchaser and to notify the Bureau that this has been done, commonly by means of a copy of a letter to the purchaser. This is evidence of good faith, as well as good public relations with customers, but such refund is not required by law nor has it ever been regarded as fully compensating for the violation of law.

Naturally refunds are made only on the particular lots analyzed and, for every deficiency found in official sampling, an estimated 40 lots go undetected and uncompensated. Furthermore, when deficiencies are found in lots sampled in the hands of dealers, it is usually impossible to locate and to compensate the actual user of the deficient material.

The performances of the firms and their standings according to deficiencies are shown in the annual publication of findings. However, there is no clear evidence that use of the record in this admonishing or coercive way is a significant corrective influence.

If discussions, formal investigative interviews, and other attempts fail to secure correction and a firm's record of deficiencies continues at a worse-than-average level, consideration is given to filing criminal complaint. In California, delivery of deficient material or other violation of the fertilizing materials law is a misdemeanor punishable by a fine of \$500 and six months in jail. Repeated deliveries of deficient material last year resulted in a fine of \$50 imposed on one firm and another \$50 on the president of the firm. This year another firm has paid a fine of \$250 for repeated delivery of deficient material.

### Investigative Interviews

During the past six or eight months we have been trying a new approach to the problem of deficiencies. Whenever a firm shows by a series of deficiencies that its performance is deteriorating, we send representatives into the nearest district office for an interview at which the firm can explain what it thinks caused the shortages and describe what steps are being taken to minimize recurrences. In particular, the firm is given opportunity to show cause why a misdemeanor complaint should not be filed against it for repeated violation of law.

It is too early to know whether this program will improve performance but it is evident so far that the discussions have helped focus attention on production problems that might otherwise have been neglected. To prepare themselves for such inter-

views, plant managers and others have critically examined their procedures and controls and have found need for corrections and a tightening of supervision. At least the interviews are providing a long list of causes of deficiencies, which in turn can be presented to other firms for consideration in the solution of their difficulties.

For example, as a result of such discussions, some firms have begun to granulate their base product instead of trying to dry mix it. Some firms have reduced the number of custom mixes they will make to minimize errors in formulation and labeling. One firm found that its scale was faulty and replaced it with a new one. Weights were found to be in error and were corrected. A defective batch buggy had to be overhauled. One firm found some of its deficiencies were caused when it incorporated a pesticide in a mixed fertilizer and did not account for the fact that the addition diluted the fertilizer mix and reduced its grade. Errors were found in assuming that raw materials were of a certain analysis or that bags contained the specified net weight. Producers of aqua ammonia have installed valves to facilitate sampling of storage tanks and arranged to test stored material daily with a hydrometer.

It is only fair to acknowledge that information developed at these formal interviews has increased the Bureau's appreciation of the difficulties encountered by formulators of mixed fertilizers. The information secured corroborates the conclusion reached in study of the deficiency patterns, that firms with good records generally achieve them not by providing larger overages in calculating their mixing formulas, but by maintaining better control over variations. However, larger overages may assist in reducing deficiencies until adequate control can be established.

### Misrepresentation

Misrepresentation is sometimes a problem with small-package garden fertilizers, particularly those distributed by mail-order, and also in the marketing of some natural mineral deposits. It is rarely a problem in connection with ordinary agricultural fertilizers.

Misrepresentation is much more apt to arise in the marketing of materials of questionable value and in the marketing of materials that must be sold for a premium price to meet excessive costs of production or shipment. For example, a firm may attempt to market a low-grade gypsum or lime deposit or a sulfur ore. When it finds that mining and transportation costs require it to sell the material for a higher price than the content of gypsum, lime, or sulfur warrants, the firm may attempt to justify the high price to farmers by claiming that the material contains other important plant foods or other secret values.

Similar problems of misrepresentation may surround marketing of materials based on seaweed, bat guano, fish solubles, or organic composts

when the plant food content alone does not seem to justify the high sales price. Some of the fringe-type products, which seem to be peculiar to the western states, commonly involve questions of misrepresentation. These are such materials as fermented extracts of manure, of cactus or other desert plants, bacterial inoculants, enzymes, and some other substances sold to improve the texture of hard, packed soils and to promote penetration by irrigation water.

**Fantastic misrepresentation of a soil conditioner based on spent acid sludge from oil refineries caused quite a stir in California two years ago until tests were conducted to demonstrate that the claims were false and illegal.**

Extravagant claims for spectroscopic amounts of micronutrients as impurities in some mineral or organic materials continue to present an occasional problem. About 20 years ago the claims for trace elements present as impurities in spectroscopic amounts reached a ridiculous level where advertisements were claiming definite agronomic value for thirty or forty elements. As a result of a series of conferences with industry, a regulation was promulgated establishing minimum levels for acceptable claims. Claims are accepted for combined calcium, magnesium, or sulfur one percent, and for copper, zinc, manganese, and iron 0.1%. Smaller amounts of molybdenum and boron are accepted but guarantees for other elements are questioned. The regulations have worked well to protect users and industry alike from misrepresentation.

### Statistical Data

The collection, development, and publication of tonnage data are not primarily the stated functions of the Bureau or of regulatory offices in general, but this incidental service or by-product of its work is of great interest and value to industry and others who use agricultural statistics. This is evident from the almost daily requests we receive from within the State and from other parts of the country for information on some aspect of tonnage data. The kinds of inquiries we have received over the years have suggested what kinds of data should be secured, what kinds of calculations should be made, and how the information might be most helpfully arranged.

Gross tonnage data are arranged by quarter, by calendar year and by fiscal year. Tonnages are segregated by grade and by kind of fertilizing material. Gross plant food equivalents are calculated as well as the tons and proportion of each plant food supplied by various kinds of material. The percentages of the total tonnage supplied by some of the most popular materials are also calculated. The average composition of dry mix fertilizers sold during the year is estimated and tabular data on registrations, sampling, and deficiencies are shown.

**Sound economic or industrial planning must be based on accurate information, and these figures are of occasional or continuing interest to firms in evaluating market trends in use of certain kinds of materials or certain plant foods.**

To promote collection of essential data and to facilitate comparison between states and assembly of national data, Bruce Poundstone of Kentucky has developed a comprehensive report form for the various states to use in collecting detailed data on a uniform basis. There is still some lack of agreement nationally on what a fertilizer is and on the difference between materials and mixtures. Perhaps more recognition will be needed of the fact that there have been developed important fertilizing materials other than liming materials and sources of N, P, and K.

California law does not provide any direct way to secure data on use of fertilizing materials according to crop

## SHOWER WATER FERTILIZER

**LOS ANGELES, CAL.**—Shower baths for milk cows are helping San Joaquin Valley dairy ranchers raise bigger field crops, according to rancher Allan Grant of Visalia. Mr. Grant spoke to farmers attending a rural health conference at the 41st annual California Farm Bureau Federation convention here in the Statler Hilton Hotel recently.

Ranchers are piping the used shower-bath water into their irrigation systems, Mr. Grant explained, together with washings from their dairy barns and holding corrals. The nitrogen and potash contained in the washings is effective fertilizer for field crops.

"A milking herd of 400 cows requires about 3,000 gal. of water a day to maintain top-level sanitation," Mr. Grant said. On his own ranch, he said, wash water from his herd of 700 Holsteins drains into an underground tank, and then is automatically pumped into a standpipe connected to the ranch's irrigation system.

"I doubt that we will ever know in dollars and cents just how much the system is worth," Mr. Grant said. "However, in terms of added cleanliness about the dairy, in fertility of soil, in increased crop production, in elimination of flies and mosquitoes and in the double use of valuable water I think we can safely say this is a good program."



or to county. The Bureau has offered to collect data by counties if industry wanted to submit it voluntarily but there has never been enough interest in the project to warrant undertaking it in California.

#### Accidents and Damages

The Bureau of Chemistry serves as a clearinghouse for complaints and reports of accidents, injuries, and damages of agricultural chemicals. Most of these pertain to the Bureau's work with pesticides, the regulations governing use of certain injurious chemicals, and the laws governing agricultural pest control operators and pilots, but the information gained in the manner serves as helpful background to assist industry in reviewing proposed labeling and marketing of fertilizing materials as well as pesticides.

Although precautionary labeling is more commonly thought of in connection with pesticides, some fertilizing materials also are sufficiently hazardous to require special labeling. In recent years, more people have been exposed to the hazards of handling ammonia, ammonia solutions, and other caustic or corrosive commercial fertilizers and agricultural minerals. Agriculturists have become more aware of the need for adequate warnings on labeling and the fertilizer industry has made progress in modernizing labels of its products to include precautionary labeling.

The Bureau of Chemistry has opportunity to suggest the addition of any necessary warning statements when labels and tags for fertilizing materials are submitted for comment prior to printing. Inspectors look for the precaution statements on labels and containers when sampling hazardous fertilizing materials and frequently call attention to their need.

Cautions are particularly necessary when handling anhydrous ammonia, ammonia solutions, aqua ammonia, liquid phosphoric acid, sulfuric acid, sulfur dioxide, and mixtures containing substantial amounts of any one of them. Several years ago a farm worker in Northern California was seriously burned with sulphuric acid while unscrewing the drum plug to apply the material to irrigation water. There was no warning label or first-aid instructions on the drum except the statement, "Do not add water." Even though water was nearby in an irrigation canal, the worker misunderstood the warning and did not realize that he should wash promptly. He drove several miles before reaching aid and was badly injured.

A few cases have been reported that livestock gained access to partially empty bags of sodium nitrate and ate enough of the chemical to cause their death. Similar losses have occurred from superphosphate and urea. For many years, the Association of Official Agricultural Chemists recommended that bags of nitrate fertilizers carry a warning, "Injurious to livestock" but this has not become standard practice.

The marketing of castor bean meal as a lawn and garden fertilizer in California has presented two serious hazards. It contains a poison and an allergen. The material is attractive to some dogs and they have died after licking it up where it was scattered on lawns or in flower beds.

In addition, some individuals are extremely allergic to it and have been hospitalized after slight exposure to the dusty material. Several firms have ceased marketing it after being involved in civil suits for damages. Other firms continue to market it with prominent and elaborate warnings on the label. The difficulty is that people do not generally know that they are allergic to it until after they have been seriously affected.

Use of a kelp fertilizer containing large amounts of salt caused severe damage in a commercial nursery when applied at the rate recommended by a salesman. Ambiguously worded directions on a concentrated mixture of

fertilizer components caused another large nursery to apply excessive amounts to valuable nursery stock in cans resulting in large losses.

Knowing what accidents have happened is of definite value to industry and collection of such information helps the Bureau help the industry.

#### Plant Regulators, Pesticides

Developments in agricultural chemicals have expanded the field of fertilizing materials to include whole groups of products that influence plants in ways undreamed of several years ago. Similar developments have been occurring in the field of pesticides, and the fields of pesticides and fertilizing materials have begun to overlap and merge. Mixtures of the two materials are marketed as multipurpose products, and products have been developed that are difficult to classify specifically in one class or the other.

With unanimous agreement of industry and regulatory officers, plant regulators have just been placed under the jurisdiction of the Federal Insecticide, Fungicide, and Rodenticide Act. The amended federal law states that the term plant regulator means any substance or mixture of substances, intended through physiological action, for accelerating or retarding the rate of growth or rate of maturation, or for otherwise altering the behavior of ornamental or crop plants or the produce thereof, but shall not include substances to the extent that they are intended as plant nutrients, trace elements, nutritional chemicals, plant inoculants, and soil amendments.

These materials have been classed as auxiliary plant chemicals in California's fertilizing materials law since 1945. This classification has been helpful and satisfactory, but some consideration may now be given to transferring them to the pesticide law to maintain national uniformity. Recent examination of the 186 auxiliary plant chemicals currently registered by 59 firms indicates that 135 of them are probably plant regulators as that term is defined in the federal law.

They may be grouped approximately as follows:

Gibberellin products .....	42
Fruit stickers to reduce pre-harvest drop of deciduous fruits ..	31
Similar products for tomatoes and other vegetables .....	11
Similar products for citrus ....	10
Hormones and vitamins to promote plant growth .....	21
Rooting stimulants for cuttings and transplants .....	13
Products to reduce sprouting of potatoes .....	5
Products to promote sprouting of potatoes .....	1
Growth shortener for chrysanthemums .....	1

The remaining 53 auxiliary plant chemicals include 38 bacterial inoculants for legume seeds and a miscellaneous group of materials for modifying the texture of soils.

In California, the laws governing fertilizers and those governing pesticides are administered by the same office, laboratory, and staff of inspectors. This permits economies in field and plant inspections and sampling and greatly facilitates handling of common problems in the merging fields. Most of the firms interested in fertilizers are also interested in pesticides and one office can conveniently handle the increasing problems of combination products and dual registration.

#### Meetings with Industry

Although it sometimes sounds like a trite platitude, it is nevertheless significantly true that the aims of a responsible industry are essentially the same as those of the control office. A well-administered law not only protects purchasers, for whom it was primarily designed, but provides protection of industry from unscrupulous and unfair competition. In fact, it is sometimes charged that regulatory offices, which normally have more frequent contact with the industry or other regulated groups than with the general public, tend to develop more into protecting industry than the public.

Representatives of firms frequently visit the offices of the Bureau, in-

spectors regularly visit the offices and plants of firms and, of course, a voluminous correspondence is maintained on sampling, analysis, economic data, and other individual matters of mutual interest.

In addition, California is fortunate in having a representative, responsible and responsive industry organization, the California Fertilizer Assn., which works in close cooperation with the Bureau. The general manager of the Assn. maintains offices in Sacramento close to those of the Bureau and frequent discussions are had on matters of mutual interest. The Assn. conducts an annual three-day conference in summer with the University of California and other officials to present a program of technical reports for all interested persons.

The close rapport between the Bureau and the industry and their recognition of their mutual problems have developed an effective cooperation in realizing the aims of fertilizer regulation. The Bureau does not see its position as a restrictive, inhibiting control over a reluctant and recalcitrant industry. It is aware of its positive function in helping agriculture and other users of agricultural chemicals to be provided with the effective chemicals they need.

The industry, on the other hand, recognizes that the minimum requirements established in the law are a necessary basis of good business. The relation between the two in California is amicable, effective, and productive.

#### WORK TRANSFERRED

MANHATTAN, KANSAS—Kansas State University experimental work at the bindweed experimental field at Canton will be transferred to Newton, Glenn Beck, director of K-State's agricultural experiment station, has announced. Mr. Beck said arrangements were completely recently with the city of Newton to lease 360 acres of land adjacent to the Newton municipal airport for use as one of K-State's 12 experimental fields. The area previously was used as a navy airfield.

## An announcement of interest to

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## Bugs Have Biological Seniority . . .

# Insects Said to be Man's Most Successful Competitor for Food

By Dr. John H. Lilly\*

University of Massachusetts

THE BIBLE doesn't say so, but it is a pretty safe bet that the forbidden apple that tempted Eve in the Garden of Eden was wormy! Only a short time ago, a distinguished scientist reported the results of a survey of pest control experts in 35 states and the Dominion of Canada which showed that few or no salable apples can be harvested from unsprayed trees. His findings are not surprising—I'm sure he expected them, but he methodically checked with other experts to gather the evidence. Anyone who has ever tried to salvage free apples from an unsprayed orchard knows what he was talking about.

We don't know for sure what would happen if all pest control measures were discontinued but there is good reason to believe that real commercial production of quality food products just wouldn't be possible with crops like apples, peaches, potatoes, cherries, grapes and citrus. Out of curiosity and hunger for some nice fresh fruit, I stopped last summer at a roadside stand which advertised the fact that no chemicals had been used to protect their crops. There wasn't a thing in sight that I would accept as a gift! The sweet corn was crawling with earworms and corn borers, the

potatoes were mutilated by various soil insects, the raspberries were well fortified with living animal protein, and the carrots were just plain pathetic.

It has been said that insects are man's greatest enemy. Unless one is a confirmed cynic who insists that man is his own worst enemy, you just about have to agree when all of the facts are considered. In the time and space available here only a sample of the supporting evidence can be presented, but the following seems significant:

In the first place, insects have been on this globe in essentially their present form at least 100 times as long as man. Whereas many of their early competitors and neighbors are known only by the fossil records they left behind, the insects are still going strong. Perhaps this should be expected because modern civilization favors them in countless ways.

Large fields, orchards and vineyards give the pest species everything they want in the way of food and shelter.

Our nicely heated and furnished homes give the household pests the same advantages with no food and fuel bills for them to worry about at the end of the month.

Our pets and livestock are well fed and sheltered but so are the pests that seek the warmth of their bodies and relish the taste of the blood.

Insects may lack intelligence, but they have several big advantages over us. They are by far more adaptable than man. They can live in all sorts of places that man couldn't tolerate, even if the space were adequate. Some of them can feed on everything we eat and many of the clothes we wear—plus a lot of other things. Their reproductive rate is simply out of our class. Even the largest human family is small in number compared with the offspring of a single pair of almost any kind of insect.

We have been speaking in general terms, so let us turn now to a few specific examples. Locust or grasshopper plagues have been known since the dawn of history, and somewhere in the world they still take a heavy toll every year. Forest fires are dreaded wherever dry conditions exist in wooded areas, but year in and year out our forests probably suffer five times as much damage from insects as from fire. In the late 1930's a little insect known as the Engelmann spruce beetle entered the state of Colorado. In the first 10 years it was in that state it is said to have destroyed enough timber to build a five-room frame house for every family in the whole state. In spite of modern control measures, the insect pests of cotton destroy enough of the crop to make a broadcloth cotton shirt each month for every man and boy in this country—i.e., 12 shirts a year for every male citizen.

No higher plant of any kind is free from insect attack, and the list of pests on many crops is indeed surprising. Almost 400 different insects attack the corn crop or the grain in storage. The list of apple pests is almost as long, and the group that feeds on common red clover is certainly well over 200. All parts of the higher plants are fed upon by insects. Leaves, flowers, seeds, twigs, stems, roots, tubers and even planted seeds are vulner-

able. One expert contends that we did not know what a "normal" potato plant looked like before the advent of DDT which gave this crop protection that it had never before had.

The direct damage caused by insects is easier to recognize than the roles they play in the transmission of plant and animal diseases. Malaria, a mosquito-borne disease, is thought by some to have been the real cause for the decline and fall of ancient Rome and of the early Greek civilization. In any case, it reportedly caused more sickness and loss of productive work than any other human disease right up to recent times. The Panama Canal was completed only after a long and discouraging struggle with mosquito-borne diseases. In World War II, the mosquitoes had to be conquered in many areas before the Japanese could be subdued.

But we don't have to go that far from home for evidence to support our thesis. Recently an epidemic of eastern equine encephalitis occurred in New Jersey. This mosquito-borne disease attacks birds, horses and man. Although there apparently had not been a previous human case of this disease in New Jersey, some 15 to 20 fatalities were attributed to it in that state this year. According to newspaper reports, people who had previously opposed mosquito control programs did a complete right-about-face and demanded more complete and drastic mosquito control efforts. Apparently the epidemic is now over for this year.

This is a logical place for short digression. Human lice and typhus fever transmitted by them have long been notoriously associated with the privations of warfare. In World War I it was estimated that 5 million Russians fell to the ravages of louse-borne diseases. Some of you may recall that in 1944 practically the entire population of Naples, Italy, was deloused with liberal applications of 10% DDT powder applied directly to the body. The results reported were highly favorable in both louse reduction and decline of typhus.

Partly as a result, Dr. Paul Mueller of Switzerland received the most coveted scientific award in the world for the part he played in the development of DDT. I refer to the Nobel prize he won in 1948, not in chemistry and entomology but in physiology and medicine!

I also think it should be made clear that not all insects are pests and villains. In fact probably only about 10,000 of the nearly 900,000 known species of insects are really important pests. The rest are either beneficial or just "neutrals" from our point of view.

We hear a lot these days about "natural" control of insect pests. This is what the American Indians had to rely upon just a few hundred years back, and apparently it didn't work out very well. The whole country then supported less than a million human beings, and to a large extent they were a hungry and pest-ridden population. Now we have 170 million mouths to feed and still have crop surpluses on our hands. I do not for a minute contend that pest control has brought about all this change, but I do feel that it has played an important part.

In fact I personally have seen crops

of potatoes, wheat and corn in Mexico, Colombia and Guatemala, since the introduction of modern pesticides and commercial fertilizers, that far exceeded the very best yields on these same lands up to 10 years before!

I do not mean to belittle natural and cultural control, nor the artificial use of any of the available natural agencies. An excellent entomologist of my acquaintance used to tell his students that mother nature takes care of at least 90% of man's insect problems, and our job is to do something about the other 10% or less. As one example, I am convinced that widespread distribution of the milky disease organism that attacks Japanese beetle larvae has greatly reduced the incidence of this pest. Yet the Jap beetle has stayed with us and we still need the protection of insecticides to check it on some of our crops and ornamentals.

Before closing I wish to say a little about insecticides and their use. Both the variety and tonnage of these materials have greatly increased since World War II. I am sure that some of our present crop surpluses—which experts predict will reverse to become shortages within 20 years—are due in part to the use of pesticides, along with commercial fertilizers, improved varieties, etc.

Insecticides are tools which can do great good if properly used, and cause damage if improperly applied. I am just as strongly opposed to the misuse of pesticides as I am to misuse of firearms, explosives, automobiles or even drugs. None of these is outlawed but there are reasonable restrictions on their use. So it should be with pesticides, both highly toxic and otherwise.

In a talk before a large group here in Boston a little over a year ago I stressed the costly and exacting research that any pesticide must undergo before it can be labeled and marketed. Anyone who has followed the recent cranberry controversy closely should now be convinced of the validity of my contention. In this case it seems to me that the publicity released in effect condemned a whole industry because a few growers on the West Coast presumably disregarded the directions and recommendations for the use of amino triazole on cranberry bogs.

Arsenic is an old insecticide which incidentally has been used often during the course of history as an agent for both homicide and suicide. I have in my hand the label from a package of arsenical insecticide which complies with the laws regarding active ingredients, solubility, dosage, number and timing of applications, antidote, etc. You simply can't ship an insecticide in interstate commerce without these and other details being clearly stated on the label.

Yesterday I walked into a strange drug store without any sort of prescription, recommendation or identification and bought this package of patent medicine just as an example. It is described as "a homeopathic preparation" to be used for "symptoms of common colds." The average dose is 1 tablet for children, 2 tablets for adults, taken every two hours until relieved. The label is not very specific as to what all this stuff contains but it does list arsenious oxide, an arsenical, as one of the ingredients! Since it was made in New York and sold in Massachusetts it had been in interstate commerce.

In closing I'm going to offer this package of cold tablets to the first person in the audience who will supply me with a couple of pounds of Massachusetts cranberries from bogs which have been cared for as recommended by the University of Massachusetts Cranberry Experiment Station. The market value of the two is about the same but I'm certain that if I make this trade, I will come out on the best end of the exchange by a wide margin!

## At your service . . .



Tall Paul Anderson is advertising sales manager of Farm Store Merchandising. He also represents other Miller publications in the Upper Midwest. Experience with a national hardware dealer magazine gives him a keen insight to the best ways of marketing through farm supply outlets.

When you want information fast, call Paul at Franklin 3-5200 or drop him a note at 2501 Wauzata Blvd. in Minneapolis.

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In Clarksdale, Mississippi . . .

## Balanced Advertising Program Aids Firm's Growth

By EMMETT ROBINSON  
and ED WHITE

Croplife Special Writers

A balanced advertising program for an extensive line of products and services is a strong factor in the growth of the Rose Seed Co. in Clarksdale, Miss., from a one room business to one of the largest operations of its type in the Delta area of the state.

Established in 1921 to handle seed on a small scale, Rose soon added a garden supply line. In 1938 the company moved to its present location on Highway 49 South, and its operation now includes Rose Seed Co., Rose Delinting Corp. and Delta Delinting Corp.

Rose is the oldest field seed house in the state, according to Harold Brownstein, manager. Playing a big role in the growth of the company has been the advertising program. Here are its ad efforts as outlined by Mr. Brownstein:

**1. Direct Mail**—A mailing piece is sent to a list of some 750 customers about every 10 days. On the list are the names of every farmer with 100 acres or more in seven Delta counties. The pieces are produced on the company's multilith machine and addressed with office equipment. Metal plates are maintained on each customer, and a third class mailing permit is used to conserve postage.

Often in two colors, the mail pieces are varied in size, shape and content as a means of capturing attention and interest. In some cases, unique, oversized postal cards are used to promote the complete line of products and services.

For example, one card listed 66 dif-

ferent products in 15 categories. Ammonium nitrate, nitrate of soda, mixed goods, Uragreen, and anhydrous am-

monia were listed in the fertilizer category.

Another card pictured a telephone

dial with different categories of products printed in the dialing holes. Still other cards carry state extension service recommendations on insect control of pasture and grain crops. The latter type points out that Rose has available all the recommended seed and fertilizers.

Postal cards also are used to promote the company's three-times a day radio program. Often the cards carry the company slogan, "Everyone Knows—for Quality It's Rose," or the company trademark, a bright red rose inside a green triangle.

A two-color, three-fold leaflet promoted Rose's acid delinted and treated cotton seed. Copy pointed out the seed was ideal to plant with chemical weed control programs which are becoming more popular in the area.

Farmers reading other parts of the leaflet get an idea of the company's attitude toward customers. For example, one paragraph reads: "If you have never planted Delta Rose Acid Delinted Seed, we suggest that you plant as little as 100 lb. along side your fuzzy cotton seed. We believe you will be more than pleased with the results."

The leaflet also issues an invitation to customers: "The doors of the plant are open for your inspection at any time. The manager will be pleased to show you through. Come in and look around."

Extra copies of advertising pieces are kept on file in the mailing room. Sometimes used to pass out to customers in the store or to answer mail queries, the pieces are stacked in

(Turn to ADVERTISING, page 13)



PICTURED ABOVE are some important aspects of the Rose Seed Co., of Clarksdale, Miss. In the top photo, the firm's trademark, a red rose, appears on the sign in front of the attractive store. The trademark appears in most of the firm's advertising. The lower left photo shows one of 12 billboards maintained year-around by the company. Posted on major roads into Clarksdale, the signs are changed every two months. In the lower right photo is Harold Brownstein, manager.



By Emmet J. Hoffman  
Croplife Marketing Editor

OVER  
THE  
COUNTER

According to John Crocker, president, Citizens National Bank, Decatur, Ill., the farmer invests in new buildings, machinery, equipment, fertilizers, spray materials, seeds, and so on where it will do him the most good. The amount of invested capital is growing rapidly. The assets invested in farm production now average nearly \$30,000 per farm. That is 68% more than it was 10 years ago. Investments of \$100,000 and more are not uncommon. In the same period, crop output per man-hour has more than doubled. Capital investments of the right kind are making farming more efficient—and that is the kind of result farmers want.

Where do farmers get most of the loans for capital investments?

Banks are the most important of the lending institutions. Many banks serving farmers today are staffed with men who have agricultural training—they know farm problems and keep up with changing needs of farmers. To give a general idea of what banks are doing—banks have over \$6 billion in loans outstanding to 2½ million farmers. More than 33% of these are intermediate-term loans—that is, the time for repayment is more than 12 months. These loans are for machinery, equipment, breeding stock, and other items of a major capital

investment nature. The other loans are for out-of-pocket costs of production—such items as for fertilizer and spray materials.

In recent years, some farmers have enlarged their credit for capital investment through integrated contracts. The firm that contracts for the crop advances the money directly or by means of its own bank. But only 5% of all farm production is under contract at any one time. So this source of capital investment credit affects only a small number of farmers.

Bankers expect the average non-real estate loan to farm borrowers to reach \$25,000 by 1975—about 10 times the present average.

Tennessee Dealer Changes  
Direction to Build ProfitsBy JESS F. BLAIR  
Croplife Special Writer

Failing to make a profit with broilers in 1957 started the Moore's Farm Supply of Selmar, Tenn., into a very lucrative farm chemical business. Owner Carl Moore had several hundred thousand broilers on contract feeding, but saw that national overproduction might lead to trouble.

It was then he started diversifying his business. He had been overlooking the row crop farmers of the area who grew cotton and other crops. Mr. Moore saw an opportunity in fertilizer and insecticides and general farm supplies.

This year his fertilizer sales passed the 1,500-ton mark, and insecticides sales were also increasing rapidly. Much of the latter increase was due to his custom service of applying cotton insecticides.

"Many of the fields are too small for airplane spraying," said Orland Moore, assistant manager and brother to the owner. "Farmers didn't want to buy sprayers for such a small acreage, so we decided to do the work for them."

The firm bought two large applicators and rigged them up with eight-row spraying attachments. These are

large self-propelled vehicles and have a separate two-and-a-half horse power gasoline motor which operates the sprayer.

If the fields are not too small, each sprayer will cover over 100 acres per day. On some of the larger fields the two machines sprayed 250 acres a day. At \$1 per acre this proved to be a nice profit. In addition, the store charged a regular retail price for the insecticides.

"The main thing in a business of this kind," said Orland Moore, "is that you need good equipment. You also need good drivers, preferably farm boys, who know the crops, the people and are mechanically-minded. Our drivers are strong, young men who can work 10 or 12 hours a day during the busy season."

Much of the business was obtained from regular customers who buy feed and other supplies from the store. All work is supervised by one of the brothers who makes sure the customer is satisfied.

Fertilizer sales were made mostly by the owners stressing the benefits of plant food. Many sales were made right in Mr. Moore's office, where he pointed out how much extra profit could be made.

"We were thoroughly sold on  
(Turn to DIRECTION, page 16)

# WHAT'S NEW

## IN PRODUCTS • SERVICES • LITERATURE

### No. 6993—Drum Tilter

Pucel Enterprises, Inc., announces the "Grizzly Roto-Tilt" for lifting and tilting steel and fiber drums for pouring and dumping powders, granules, chemicals and other materials. It is a one-man operation, the company says, and can be used with fork truck, chain falls, chains and hoists.



Works on old and new steel and fiber drums, containers, barrels and boxes, closed or open, battered or lopsided, the company says. It weighs 60 to 80 lb., depending on the model, and has a lifting trolley with ball bearings, safety locking bracket with serrated jaws for attachment on top rim of drum, and a recessed foot plate to hold drum bottom. For more information, check No. 6993 on the coupon and mail.

### No. 6994—Boron Guide

"Guide for Use of Boron Fertilizer" is the title of a publication made available by U.S. Borax & Chemical Corp. The guide is designed to be helpful in calculating the amount of fertilizer borate or "Solubor" equivalent to definite recommendations in

terms of borax for many crops. For copies of the guide, check No. 6994 on the coupon and mail.

### No. 6995—Insect Control Booklet

A 10 page booklet entitled "Better Control of Insects in Stored Grains" has been published by Stauffer Chemical Co. Among subjects discussed are sanitation methods, grain protectants and fumigants. A feature is a wall chart which includes identifying sketches of principal stored grain insects. For copies of the booklet and chart, check No. 6995 on the coupon and mail.

### No. 6996—Pail Rack

Hub States Chemical & Equipment Co. announces a method of dispensing liquids from 5 gal. containers. Called the "Pour-Easy" pail rack, the unit provides a means of dispensing from this size container. The balanced container eliminates waste by spilling, the company says. Clamping of the



band is performed by tightening a plated wingnut. For details, check No. 6996 on the coupon and mail to this publication.

### Also Available

The following items have appeared in previous issues of Croplife. They are reprinted to help keep dealers on the regional circulation plan informed of "What's New."

### No. 6985—Business Machine Booklet

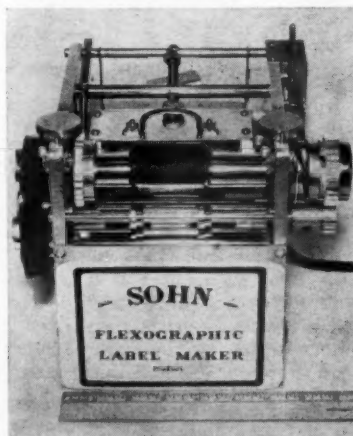
"Your Keys to Better Business," a free 35-page illustrated booklet has been made available by the Victor Adding Machine Co. The booklet, written for owners and executives of both large and small firms, features latest model Victor adding machines and calculators with information on applications, features, specifications and protective maintenance. For copies, check No. 6985 on the coupon and mail.

### No. 6988—Spray Nozzle Manual

Spraying Systems Co. announces the availability of a spray nozzle manual for liquid fertilizer sprayers. The extensive catalog contains illustrations, blueprints, statistical data, specifications and information about spray nozzle design and application. All of the company's line of spraying equipment is described. For copies of the catalog, check No. 6988 on the coupon and mail to this publication.

### No. 6992—Label Maker

Sohn Manufacturing, Inc., announces a flexographic printing press which prints and diecuts on pressure sensitive label paper, or score cuts on gum, heat seal or plain paper.

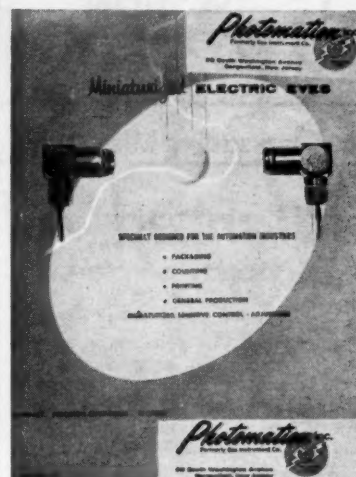


Size is 9 in. by 9 in. by 9 in., without the guard case. Weight is 40 lb. It prints 6,000 labels an hour, and colors and printing plates can be changed in seconds, the company says. For further details, check No. 6992 on the coupon and mail.

### No. 6991—Electric-eye Manual

A 16-page booklet describing in detail miniaturized electric-eye applications for counting, sorting, monitoring, assembling and automatic weighing as applied to packaging, printing and general promotion, has

been announced by Photomation, Inc. The equipment described in the manual ranges from direct or partial cut-off to reflector type units. It contains an expanded section dealing with specific in-plant installa-



tions. Technical and specification data includes dimensions, circuitry, speed, monitoring and relays. For copies check No. 6991 on the coupon and mail.

### No. 6987—700 Cu. Ft. Transport

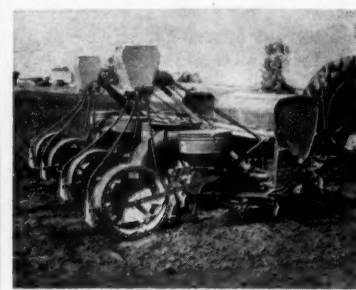
Sam Killebrew, Inc., announces the "Bulk-Hauler" 700 cu. ft. capacity transport. It has four buckets and is designed to haul all bulky materials. A two cylinder air-cooled engine furnishes power to the hydraulic system



which permits the operator to dump each bucket individually. The hydraulic system comes with both pressure and mechanical cut offs so that the buckets cannot be raised beyond a full dumping position of 45°. It can also be used as a bulk type spreader. More information is available by checking No. 6987 on the coupon and mailing.

### No. 6986—Herbicide, Insecticide Applicator

Noble Manufacturing Co. announces the development of a two-in-one applicator for applying insecticides and herbicides at the same time. The unit is primarily a granule-holding hopper



that is actually two hoppers in one, the company says. It mounts on all planters, listers and seeders, and in operation, one hopper compartment supplies insecticide near the seed while the other feeds the 14 in. wide band of herbicide. Named the "Simul-Caster," it has a capacity of 32 lb. herbicide and 16 lb. insecticide. For more information, check No. 6986 on the coupon and mail.

Send me information on the items marked:

- |   |  |
|---|--|
| <input type="checkbox"/> No. 6985—Business Machine Booklet          | <input type="checkbox"/> No. 6991—Electric-Eye Manual    |
| <input type="checkbox"/> No. 6986—Herbicide, Insecticide Applicator | <input type="checkbox"/> No. 6992—Label Maker            |
| <input type="checkbox"/> No. 6987—700 Cu. Ft. Transport             | <input type="checkbox"/> No. 6993—Drum Tilter            |
| <input type="checkbox"/> No. 6988—Spray Nozzle Manual               | <input type="checkbox"/> No. 6994—Boron Guide            |
| <input type="checkbox"/> No. 6989—Liquid Applicator                 | <input type="checkbox"/> No. 6995—Insect Control Booklet |
| <input type="checkbox"/> No. 6990—Bulk Trailer                      | <input type="checkbox"/> No. 6996—Pail Rack              |

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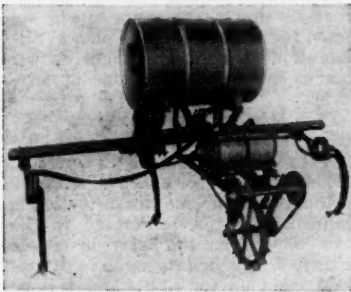
Reader Service Dept.

Minneapolis 40, Minn.



## No. 6989—Liquid Applicator

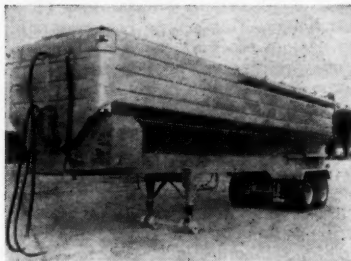
John Blue Co., Inc., is manufacturing a device called the "Liqui-Placer" for use with a tractor cultivator. The pump, which has 6, 8, 12 or 16 outlets, is capable of outputs in excess of 100 gal. per acre. The



pump is equipped with roller chain drive and can be adapted to rear tool bars, grain drills, trailer type applicators and so on, the company says. A quick change sprocket mounting makes 90 different rates of output possible. For more information check No. 6989 on the coupon and mail.

## No. 6990—Bulk Trailer

The addition of an all-bulk transport model to the Chief line of self-unloading transports has been announced by Henderson Manufacturing Co. The Model BT-300R has twin floor auger conveyors and is completely hydraulic in operation, the company says. The unit features a



push-button control system which enables the operator to control the entire unloading operation from one central control panel. The unit is available with either auger or air-unloading systems, and is built in sizes up to 40 ft. in length. For details check No. 6990 on the coupon and mail.

## NPFI-Sponsored Research Work in South Carolina to Continue

CLEMSON, S.C.—Research work to determine the factors limiting the production of corn, cotton, and soybeans is continuing at the Edisto Branch Station of the South Carolina Agricultural Experiment Station, announced G. H. Collings, head of the department of agronomy at Clemson College. This work, which was begun in 1958, is being supported in part by a grant of \$2,500 from the National Plant Food Institute.

The study was originally set up to evaluate the effectiveness on yield of such factors as increasing rates of nitrogen, phosphate and potash, and of irrigation versus no irrigation. Rates of the plant nutrient elements that were applied vary from nominal rates to quantities which are much in excess of those currently being used in most farming operations. Irrigation water was applied whenever the soil moisture tension at a depth of 12 in. reached a certain level. Tissue analyses as well as soil analyses were made throughout the growing season and the differences observed will be related to plant growth and crop yields.

The data will be studied in an attempt to determine which of several factors may have limited crop yields. In succeeding years, the limiting effect of the suspected factor will be removed and the experimental work continued. It is believed that such

procedure of studying the data and modifying the experiment in the future years will result in a successive raising of the yield level as well as a continuing evaluation of those quantities which are responsible for plant growth.

Plans for the coming year include the imposition of a fumigation variable to determine if nematodes have any effect on the yield of these three crops. Other quantities which will be successively evaluated are the effects of trace elements; of deep and uniform plowing with a uniform admixture of plant nutrients to a depth of 2 ft.; of hybrids or varieties; of light; of temperature; and possibly of the carbon dioxide content of the atmosphere.

Dr. Tom Peele, under whose immediate direction the study is being carried out, states that information obtained from experiments such as these can do much toward improving crop yields in South Carolina. While some of the treatments imposed in

the experiment may be considered unusual by current standards, Dr. Peele states the only way to determine whether or not such practices are economically feasible is to determine first the effect they have on crop yields. When the yield curve for these various crops is thus more completely described, farm management specialists and economists will be in a much better position to advise the farmers of South Carolina the yield level at which they should gear their management practices.

It is expected that the study will continue for a number of years and that the NPFI will continue to lend limited support to this undertaking.

## RETIRED SOILS MAN DIES

ST. PAUL, MINN.—Frederick J. Alway, 85, soils division head at the University of Minnesota from 1914-1942, died Sunday, Nov. 15, at his home in St. Paul. He had been in failing health for some time.

## Personnel Changes

MONTPELIER, IDA.—Three personnel changes in the Central Farmers Fertilizer Company's Idaho phosphate works were recently announced here by Avery L. Stutts, general manager.

Max Lattig, staff engineer, is now staff assistant to the firm's president at Chicago with Foy E. Walling succeeding Mr. Lattig. Nate Weber was named new purchasing agent for the Idaho Phosphate works.

## SUNOLIN TO EXPAND

PHILADELPHIA—SunOlin Chemical Co. will expand its facilities in North Claymont, Del., to include the manufacture of ethylene, according to James I. Harper, president. The new plant will cost approximately \$15 million, with ultimate capacity of nearly 200,000 lb. a year. SunOlin is an equally-owned affiliate of Sun Oil Co. and Olin Mathieson Chemical Corp.

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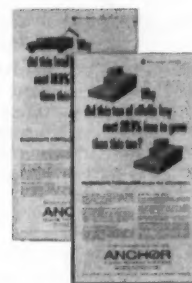
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# Using Deferred Compensation In Small Business

By W. T. THACH  
Oklahoma City, Okla.

and

H. M. COVERT, JR.  
Allentown, Pa.

Deferred compensation is a method of increasing a key employee's pay in the future rather than in the present. The aim is to provide a way through which, after retirement, he will continue to receive pay from his employer as a reward for past services rendered. Such pay, of course, would be a reduced amount—say one half to one quarter as much as his salary during his active years.

## What Deferred Compensation Means

One effect is that the key employee's total compensation is increased. But the increase does not become effective until after he has retired. In this way, an employee's security for the future is materially strengthened. A second aspect of deferred compensation relates to the premature death of the key employee. If that happens, the payments which he would have received after retirement are usually paid to his wife or children instead. Here is an illustration:

● **A Practical Example.** Mr. Aldershot (name fictitious) is 55 years old. He receives a salary of \$15,000 per year, and his employer provides for him a deferred compensation arrangement. In this case it means that he is to receive \$5,000 per year for 10 years after he retires at age 65; that is, from age 65 to 75. If he should die before age 65, the \$5,000 per year will be paid to his wife or children for the 10-year period.

It won't cost the employer any more to pay \$5,000 per year for the 10 years after retirement than it would to give Mr. Aldershot an immediate \$5,000 increase in his salary. Either way, the cost to the employer in this particular case would be \$50,000 over a 10 year period.

● **Flexibility.** Deferred pay, of course, need not be given instead of immediate salary increases, but may be given in addition to desirable current pay raises. Moreover, your current salary scales should be adjusted from time to time to keep them in line with your competition. A happy key man must have adequate current pay to meet his living expenses. However, it is often not good economics to increase his current taxable salary enough to give him a sufficiently large margin over current living expenses to provide his own income after retirement. This is particularly true when it can be arranged at lower cost through your business.

● **A Further Step.** For instance, push the earlier example one step further. If, instead of arranging deferred pay for Mr. Aldershot, the company increased his salary enough for him to provide his own income for that period, what would happen? For him to be able to lay aside \$5,000 a year for 10 years, he would need an increase of \$6,666 (assuming a 25% rate applicable to the \$6,666) to have \$5,000 left after income tax. Thus, the company would have to pay \$16,666 more than the \$50,000 needed to finance the deferred plan (ignoring interest to simplify the mathematics). As the applicable income tax rate goes higher, this effect becomes more pronounced.

## Significance for Small Concerns

Small concerns must continue to compete with large corporations for markets, management talent, materials, and money. They must produce as good a product and be able to sell it at a competitive price. Managerial skill and know-how are of utmost importance in accomplishing these purposes. Large firms usually have the advantage of being able to pay more, to offer a wider opportunity, and to provide a broader range of fringe benefits with perhaps more job

prestige. Consequently, a small concern has a two-fold problem: Attracting good men, and keeping them once they are hired. Through deferred compensation it is possible for a small firm to cope with some of these large-firm advantages.

● **A Case in Point.** To illustrate, suppose your firm wants to get a key executive to fill an important post. This man may be participating already in a generous pension plan. He may be covered by a substantial amount of group life insurance, group hospitalization, and major medical, accident and health services. He may be involved in stock ownership plans.

Your small concern will have a problem in hiring such a man.

Maybe you can bid for his services by offering the inducement of a larger salary. But salary increases don't always mean very much in these days of steeply progressive income tax rates. However, if you supplement the annual-salary offer with a generous deferred-pay agreement, the after-retirement security growing out of it may well be all the inducement you need. This can be particularly true if you provide substantial death benefits for the family by making the deferred payments to the wife and children in case the man dies prematurely.

● **Keeping Good Men.** In the same vein, suppose you have a valuable key man whose loss would be damaging to the successful operation of your business. What can you do to hang on to him? One answer is: Arrange things so that his lot will not be bettered if he shifts to a large corporation. When his retirement years are made secure and when adequate provision is made for his wife and children in case of his premature death, there is much less tendency for a man to look longingly at the big corporations.

## How Deferred Compensation Operates

The workings of deferred compensation plans have many variations. Here is one approach: The employer enters into an agreement with a key man to make certain payments to him after his retirement, say \$2,500 per year for 10 years. (Here, again, identical payments will be made to wife and children in case of premature death.) The usual retirement age is 65. Payments are contingent on his still being with the company when retirement time comes (or when death occurs). After retirement, he agrees not to give away trade secrets, not to enter into competition, and to be available for consultation or advice at reasonable times and places.

● **Meeting Individual Needs.** The company is, of course, not bound to continue the man in its service. It can terminate employment, or the key man can resign at any time. Sometimes a formal, written agreement

is executed, setting forth the provisions of the plan; sometimes the employer merely writes a letter to the key man, informally describing the plan; and sometimes no written agreement at all is used.

One question naturally arises: Will the payments, when they fall due, be paid out of current income, or out of some fund which has been provided for this purpose? Such a fund can be built up with securities or cash over a period of years by the firm. This plan can be underwritten by the purchase of life insurance of the paid-up-at-age-65 variety.

● **The Role of Insurance.** Here's how that works: On the one hand, a company buys a policy on its key man. The firm pays the premium, owns the policy, and is the beneficiary. If the key man should die, the face value of the policy is paid to the company, and the company receives it free of income tax. On the other hand, as the company makes deferred compensation payments, the amounts are income tax deductible.

The following figures show the result. If the policy is worth \$100,000 the company will receive the \$100,000 death proceeds without having to pay any part of it as income tax. When the company makes the series of \$10,000-per-year deferred compensation payments for 10 years—a total of \$100,000—it can deduct this amount from its taxable income as a legitimate cost of operation. Consequently, the payment of the \$100,000 in deferred compensation actually costs the business only \$50,000, assuming a typical 50% income tax bracket.

The concern has, of course, paid premiums to the insurance company. But to see further how that works, suppose a particular firm has paid an insurance company \$20,000 in premiums. Eventually the firm receives \$100,000 death benefits, free of income tax. This constitutes net gain of \$80,000. Then recall that it costs the business only \$50,000 to provide \$100,000 to the widow. So, finally, the business ends up some \$30,000 better off.

This kind of gain is not the real goal of the plan; it is merely a by-product. How things work out in the event the key man lives on into retirement will be discussed later in this article.

## Applications in Very Small Firms

In very small firms, it may well be that deferred compensation should be applied to only one or two key men. Nevertheless, this method of providing security in retirement, and security for wives and children, is entirely suitable for even these concerns. Moreover, the usual alternative—the installation of a qualified pension-trust plan, with the many papers and reports required by the Internal Revenue Service—calls for a disproportionate amount of paper work when

the retirement plan includes only two or three people.

● **Management Discretion.** For small firms, one of the most attractive features of a deferred compensation plan—in contrast to the classic pension-trust—is that participants can be selected for inclusion in the plan at the discretion of the management, rather than as entire classes, groups, or categories.

Then, too, a small company's deferred compensation plan does not have to be submitted to the Internal Revenue Service for approval, because no immediate income tax deduction is claimed. The tax advantage to the firm comes after the key man retires or dies. The payments made to the retired key man (or to his widow if he dies before retirement) are considered the same as salary, if paid in accordance with a previous agreement. As such they are income-tax-deductible by the business.

In order to assure the payments to a widow, a really small firm would usually want to underwrite the plan through the purchase of life insurance on the executive. When that is done the policy used is generally the life-paid-up-at-age-65 type.

● **Operation After Retirement.** The mechanics of the plan after retirement operates as follows: Assume the insured key man lives to age 65, and retired at that time. The firm would then have paid to the life insurance company, in the form of premiums, an amount in the neighborhood of \$30,000 to \$40,000 on a \$50,000 policy. This policy becomes paid up at age 65, and the firm pays no more premiums. The insurance company then stands ready to pay the \$50,000 to the firm whenever the insured dies.

Now suppose the key man lives 10 years after retiring, and that his firm pays him \$5,000 yearly. This makes a total of \$50,000 in those 10 years. The firm deducts those payments from company income, just as if they were salary, in arriving at its income tax liability. With a 50% income tax bracket, the cost to the firm of the payments is only \$25,000.

Suppose, finally, that the insured dies at the end of the 10 year period. At this point, the firm receives income-tax-free \$50,000 in life insurance proceeds.

If the total premiums amounted to \$30,000 the plan has cost the firm \$5,000. But it has cost only \$5,000 to give the executive \$50,000 in protection for wife and children throughout the whole period, and to pay \$50,000 to the retired key man.

● **Variations.** Such a plan has many variations, among them a provision for annual payments after retirement only if the executive continues to live; that is, if he dies at age 67, there will be no more payments, even to his heirs. Or, monthly payments for life can be specified, instead of for only 10 years, for example. Because the circumstances of firms differ, each deferred compensation plan should be tailored to fit the particular concern.

## Getting a Deferred Compensation Plan Going

The first step is to consult an attorney, accountant, or a life insurance underwriter with knowledge of this particular field and with experience in it. Perhaps you will wish to talk with all three. Certainly, any plan you consider should be checked for tax implications by a qualified specialist experienced in the work. Your plan should be checked also for contractual implications by an attorney who is competent on such matters. Finally, your plan should be designed by a life insurance underwriter with a background on this subject if the plan is to involve the use of life insurance.

● **Basic Decisions.** A decision needs to be made as to just which persons are to be included, and what size pay-

## SUMMARY

Deferred compensation is a practical approach to paying executives in small companies. Basically, it means giving a key man a raise, but paying out the actual money after he has retired. Numerous individual variations are possible such as having some salary increase deferred and some current, or arranging to pay the postponed income to a man's heirs if he dies before collecting.

Small businesses often find deferred compensation a great help in attracting and holding good management talent in competition with big corporations. From a strict dollars-and-cents standpoint deferred compensation can be a very economical way of providing rewards for services rendered, and security for executives and their families. Protection for the company can be built in to make sure the retired executive does not give away trade secrets or start a competing organization.

The money to operate a deferred compensation program can be accumulated through a special fund of securities or cash, or through insurance. Participants for inclusion in the plan can be picked at the discretion of management. The plan does not have to be submitted for approval to the Internal Revenue Service.

This article explains deferred compensation in specific terms and suggests practical steps in getting such a plan started. This article was prepared through the cooperation of the Small Business Administration.



ments are to be specified for each. You should decide what restrictions are to be placed upon the retired key man if he is to qualify for payments of the retirement amounts—such as the giving of counsel and advice, restrictions from entering competing businesses, or from divulging trade secrets. You should decide whether payments are to be made to heirs, should the key man die either before or after retirement. You should choose between a formal contract, an informal letter of intent, or an oral arrangement. You should specify whether either party can terminate the arrangement, and under what circumstances. And you should also determine whether a key man severing employment prior to retirement would have a "vested interest"—that is, a right to some of the money if he quits—and how the actual amount of any vested interest should be computed.

● **Professional Advice.** You should discuss these and other technical aspects of a proposed plan with legal and accounting counsel, and you should confer with a life insurance underwriter experienced with such policies. Don't guess as to the desirability of using life insurance or internal funding in your set up. Learn the full range of facts and their significance to your business. After the proper information has been developed, a plan can be simply and easily put into effect.

#### Pitfalls to Avoid

Here are five suggestions to avoid common pitfalls:

(1) Set up your plan in such a way that you won't be "stuck" with a key man whom you might have to "fire," or whose employment you may wish to terminate for one reason or another; be sure the agreement does not contain an actual or implied guarantee of a certain salary, or even continuing employment up to retirement age.

(2) Be sure the plan is clear as to what "vesting," if any, a person has upon severance of his employment.

(3) Be sure that the plan is set up in such a way that the premium (if insurance is used), or the annual "funding" (if some formal method of funding the plan is used), will not be taxable as current income to the key man.

(4) Be sure your plan is set up so that the entire value of future payments won't be taxable as income to the key man in the year during which he retires.

(5) If you use life insurance, be sure that the life insurance policy is merely "key man" insurance, and is not tied into the plan as a funding device.

It is, of course, impossible in a single article to cover every facet of a technical program of this kind. It takes planning and careful thought. So take seriously the admonition to have the final specifications of your plan approved by competent legal, tax, and financial authorities who are familiar with deferred compensation.

#### New Soybean Variety

PLAINVIEW, TEXAS—A new soybean variety known as Hill and supposed to be resistant to bacterial pustule, wildfire and frogeye, all major diseases, has just been released by the U.S. Department of Agriculture and nine state agricultural experiment stations.

The new variety is recommended for the High Plains and Rolling Plains of west Texas, according to Dr. Lee C. Coffey, extension agronomist.

#### SOUTH CAROLINA SALES

CLEMSON, S.C.—Fertilizer sales in South Carolina during October, 1959, amounted to 13,232 tons or 21,398 tons less than the same month a year ago, reported B. D. Cloaninger, director, fertilizer inspection and analysis department, Clemson College. Accumulated sales for the July through October, 1959 period were running 34% less than a year ago.

## ADVERTISING

(Continued from page 9)

separate compartments, making each easy to find.

2. **Newspaper**—Rose carries an ad on the farm page of the local daily every Friday to promote seasonal or specialty items. Mr. Brownstein estimates 2,000-3,000 inches are used each year. On occasion, and especially during a period when several products are hot, ads are run in a farm paper covering the entire Delta. At times ads are placed in seed magazines to push the company's wholesale seed business.

3. **Billboards**—The company uses 12 billboards the year round, posted on major roads leading into Clarksdale. Changed every two months, the signs advertise seasonal merchandise. Some of the boards are on a co-op basis, and many of them carry the red rose trademark and company slogan. On the major highway into town the entire display of one sign is devoted to the slogan.

4. **Advertising Novelties**—Giveaway items for customers include clips for use on boards or to hang on a nail, matches which may be picked up in the salesroom, scratch pads, and pencils.

5. **Miscellaneous**—The paneled salesroom and offices of the company are used to an advantage in several ways. Displays of grain and other products are placed neatly in front of the large plate glass windows. On bulletin boards are posted pictures of company operations and advertising tearsheets from the local paper.

Among the products and services offered are seed oats, seed wheat, seed barley, alfalfa, grasses, clovers, defoliants, fertilizers, grain fumigants, cover crops, weed killers, cotton pick sacks, sprayers, seeders, rat control products, wire ties and twisters, cattle sprays and insecticides. Both mechanical and acid delinted services are offered for cotton seed.

**The company operates with a minimum of 15 employees and at times the number reaches 30 when the delinting plant is operating. The fleet of 14 vehicles includes pickups, tandem and 18-ton trucks.**

When a customer wants the services of an entomologist, Rose contacts a representative of a chemical company, who keeps a close watch on insect infestations. Assistance with calibration of equipment is readily available, and farmers can refer to a list of available aerial applicators.

"Our aim is to offer quality products at competitive prices," Mr. Brownstein says. "Quality, of course, is in keeping with our slogan."

The manager added that the company does everything possible to keep its name before the public. "In this day and time, you've got to do that. We feel our advertising program accomplishes this. In addition, it helps sell merchandise."

"But in the final analysis, it is the reputation you build up through the years that counts. And that boils down to helping your customers make money out of their operation. I mean such things as getting out and helping them in time of emergency, as well as day to day service and advice."

#### ATTENDANCE RECORD

NEW YORK—Attendance at the Packaging Machinery Manufacturers Institute Show of 1959, which closed Nov. 20 at the New York Coliseum, nearly doubled the record set at the previous PMMI Show in Atlantic City. A total of 19,853 men and women viewed displays and demonstrations of the newest packaging machinery and materials exhibited by 159 exhibitors during this four-day event. Over \$3-million worth of packaging machinery and materials were displayed on two floors of the New York Coliseum during the show.



EXAMINING a California research study, left to right, are: Douglas Kleist and Luverne Donker, research workers; Dr. Orville Thompson, directing the study, assistant professor of education, University of California, Davis; and Dr. Richard B. Bahme, National Plant Food Institute.

## California Farmers Use Fertilizer Dealers For Advice, Assistance, Study Indicates

SAN FRANCISCO—That the California farmer relies heavily on the advice and assistance of well-established fertilizer concerns to help determine his fertilizer needs and methods of usage, is indicated in a study just published by the University of California.

According to Dr. Richard B. Bahme, Western regional director of the National Plant Food Institute, which sponsored the study, farmers indicated that fertilizer company representatives were their main source of information in determining their fertilizer practices. "Almost three-fifths, or 60%, of the farmers listed fertilizer fieldmen as their primary source of information. Farm advisors were the sources for two-fifths of the farmers." The report covers a survey of farmers and a total of 81 agency representatives serving farmers in two California counties. Object of the study was to determine who helps the farmer most in his use of fertilizers.

"According to fertilizer company representatives interviewed," Dr. Bahme continued, "almost all (90%) of the farmers purchasing fertilizers ask for information on kind and amount to use, proper placement, and proper time of application. These company representatives further reported that three-fifths of the farmers follow the recommendations they give them."

The study was conducted by two University research workers, Luverne Donker and Douglas Kleist, under the direction of Dr. Orville Thompson of the University's department of education at Davis. The study is titled, "How Fertilizer Dealers Affect Fertilizer Use." The interviewers stated that they found close correlation between the statements and comments made by the agency and the particular farmer who did business with the agency. Agencies interviewed included 42 fertilizer companies, 22 processors, 12 service, and eight loan agencies. Those agency representatives questioned represent 90% of such personnel employed in the two counties.

According to the report, the sample counties were selected because they had a good representation of the major fertilizer-using crops in California and contained both large and small-scale farming operations.

"General services provided by the fertilizer companies and other agencies to farmers include economic and general advice, soil sampling tests, leaf analysis tests, in addition to specific information about fertilizers and their use," Dr. Bahme said.

Over 80% of the agency representatives interviewed had some college training, the majority being graduates of the University of California at Davis. Of these, one-half were four-year college graduates. "Of the agencies contacted, two-thirds has been in business over 20 years, and the majority of persons interviewed had more than 10 years of experience in the fertilizer business, according to the report."

The representatives interviewed reported using the following sources in keeping up-to-date on fertilizer usage: bulletins and circulars published by agricultural colleges, company research and research of other commercial concerns, farm advisors, their own test plots, and Soil Conservation Service specialists.

The report states, "It appears that the most efficient way to influence farm practices (on correct fertilizer usage) would be through these 'key people'."

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# OSCAR & PAT

When Oscar Schoenfeld came to work one rainy fall morning, the front door stuck slightly when he unlocked it. As Oscar pushed hard, his fingernail on his right thumb bent slightly and cracked and a sharp twinge of pain went through the finger.

"Donner and Blitzen!" Oscar swore softly and rubbed his thumb. With his knee he pushed open the wooden door and gazed balefully at it, as though the door was to blame for the rainy weather, the high humidity, the swelling of wood, and so on.

"Ach," he said apprehensively. "I'll bet I can't grab the pencil so well to figure discounts."

He approached Tillie's desk and gave it the usual critical inspection he always did. He frowned as he saw a candy wrapper on the floor, and a piece of tissue paper with red lipstick on it, next to the typewriter.

"Ach, so she eats candy bars on

our time," Oscar grumbled. "And she paints. She must have Indian blood in her. Ach, Minnie don't paint."

Now Oscar turned to Pat's desk which was back to back with his inside the white railed in enclosure which was a carryover from a man who owned this building long before Oscar and Pat bought the structure. "Ach, du Lieber Himmel," he exclaimed. "What is that?"

On Pat's desk Oscar saw about twenty five key ring holders without keys lying helter skelter over a group of letters and other papers. Standing on the desk, too, was a 10 qt. galvanized pail and it was full of granulated fertilizer. With spout sticking up lay a red plastic funnel atop the contents of the pail. And some of the granulated fertilizer was spilled over the key ring holders and some had trickled on the floor.

Oscar looked up and saw Ann Hydrous, the grey Maltese cat lying atop

the old safe nearby. Her sleepy eyes were fathomless.

"You schtinker!" Oscar thundered, neurotically happy to find some living thing to blame for the messed up desk. "Did you do this?"

Oscar's cracked thumbnail began to throb and he looked at it angrily. "Ach, I knew it," he said. "This is my badt day. First the sticky door and my broken finger nail. Then—then this messy desk. Oh, I wish I hadt a partner who is neat like me. I can't schtandt him much longer."

The door opened and in came plump, ulcerish Tillie Mason, the bookkeeper, neatly outfitted in a plastic see-through raincoat, hat and galoshes.

"Tillie!" barked Oscar, "look at that Irisher's desk. All messed up. It looks terrible. Why can't we have a decent lookink store effery mornink? Why can't people clean up their desks before they go home nights?"

Tillie saw his glance and felt a lit-

tle uneasy in her stomach. She wondered if the very atmosphere of this place with its fighting, fussing and feuding was responsible for the failure of her ulcer to get cured. She took a look at Pat's desk, then laughed.

"Puzzling, isn't it?" she laughed. "But isn't that just like him? Ideas, he's full of them. Probably worked here late last night."

"You bet he's full of ideas!" Oscar burst forth, pacing back and forth. "He's so full of ideas he's got no time to go out and collect on oldt ones—like the people he soldt at discounts and who ain't paidt yet. He's crazy, that man. If he wouldt stay home and sleep days and nights, too, this company wouldt get along much better."

Oscar would have gone on a lot longer cussing his absent partner but at that moment Pat himself came in. He wore a sporty topcoat which dripped with rain.

"Well," he said cheerfully looking at Oscar's baleful face, "who died this morning?"

"Nobody died," Oscar snapped practically. "But look at that mess on your desk. Why can't we have a clean schtore once in a while?"

Pat chuckled and hung up his dripping coat. "Oh, I think we can blame it all on you, Oscar."

"On me? Ach, I didn't do that. I would not be so crazy as to mess up a desk like that."

"I certainly would bet on that," grinned Pat, "but I heard about you chasing that calendar salesman out of the store when he tried to sell you a calendar with a naked lady on it. And that gave me an idea."

Oscar sneered. "Ach, I always thought you were that kind. Your wife shouldt be ashamed of you, too."

But Pat was in a good mood and let the insult pass. "I figured, Oscar, that instead of giving our farmers a calendar with a—er questionable picture on it, that we give the farmers key ring holders with a plastic tab."

Oscar looked disgusted. "Don't give the farmers nottink. Why do you always want to give them something? They neffer give us anythink but trouble."

"Oscar," he said, "in that plastic tab—I'm sure we can get a plastic company to make them for us—we'll put in a little 10-10-10 fertilizer and seal it. Then we'll have an imprint on the outside saying it's 10-10-10 and we're the place to get it."

"All that expense, all that advertising!" Oscar looked more disgusted than ever.

Pat looked surprised as he put his long legs up on his desk. "Why every farmer wants a new keyring holder now and then. He carries it in his pocket. He uses it many times a day. And every time he does, he'll think of fertilizer—and us! We couldn't spend our advertising money any better."

"Why worry about spending our advertising money!" Oscar growled, his face livid. "What's wrong with leaving the money where it is—in the bank?"

"You've got to make money work for you to make money," Pat pointed out. "If fertilizer dollars bring in three times their value to the farmer, then our dollars invested in advertising on a 2% budget basis will bring in more harvests for us, too."

Oscar swallowed hard. "That pail and red funnel!" he choked. "Are you trying to fumigate with it, and wastin' all of it?"

"Oh, that," Pat laughed. "I had a ball with that idea last night. I'm experimentin' Oscar and if it works out, we'll have another dandy giveaway."

"Giveaway!"

"Sure. Farmers eat a lot of eggs for breakfast—boiled eggs. If we could come up with a three minute egg timer that would use granular fertilizer—wow—think of the advertising we could get every morning in hundreds of farm kitchens."

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# FARM SERVICE DATA

## EXTENSION SERVICE REPORTS

Cover crops in many California orchards have produced no significant evidence of crop yield increase, unless supplemented by commercial fertilizer, according to the California Fertilizer Assn.

Citing research trials with orchards which have been continuing since the 1920's at Davis, the principal campus of the University of California College of Agriculture, the association quotes from the October, 1959 "Orchard Letter," prepared by Walter M. Anderson of the Yuba County Agricultural Extension Service office as follows:

"We formerly grew cover crops in orchards because they were believed to make needed plant food available for the trees. When growing annual crops, such as rice or sugar beets, cover crops can increase yields of following crops. Trials with orchards have been continuing since the 1920's at Davis, but show no such increase for orchards.

"In the words of Prof. Proebsting, if an orchard is deficient in nitrogen, you had better buy it and not depend on cover crops to supply it. The same trials show that water penetration was greatly improved with cover crops on this land previously farmed to grain. Growers with water penetration problems on soils with plow pan present can obtain improved water penetration by using cover crops.

"Another possible advantage of cover crops can be that the ground is firmer, providing more solid footing for spray rig operation in wet winters. There are several disadvantages of cover crops as the practice is no longer followed by the majority of orchardists. Growing cover crops adds to the frost danger in the spring and makes it difficult to remove pruning brush with a buck rake.

"There is interest in permanent or semi-permanent cover crops locally. A few growers are trying this system from which further information on the practice can be obtained."

★

Two University of California researchers report that a study of the effects of 2,4-D weed control spraying on annual legumes has revealed two periods when the spray can be used with minimum damage to the legume.

Using rose clover, W. A. Williams, agronomist, and O. A. Leonard, botanist, studied the effects of 2,4-D on plant growth, seed production and seed viability.

The study showed 2,4-D amine to be less destructive than 2,4-D ester to the rose clover in the early growth stage. No difference was found in the later stages.

For brush sprout and seedling control in areas cleared of brush and seeded to the ripe stage, or second-best to the vegetable stage, use for good likelihood of stand reestablishment from first year stands.

For control of weedy herbs in grain fields seeded to rose clover or in rose clover fields for seed production, 2,4-D should be applied before the bud stage to avoid damage to seed germination. "Seed and forage production very likely will be reduced," the researchers said.

★

Nitrogen may be the key element in increasing grain sorghum yields, according to tests conducted at the

Lubbock Agricultural Experiment Station.

**Plots treated with 80 lb. nitrogen per acre produced just as well as other areas which had the same nitrogen but also 40 lb. of phosphorus. Heretofore, the station has recommended both nitrogen and phosphorus, and does not have an explanation as to the results. However, fertilization studies will be continued, with various kinds and amounts tried.**

The plot with 80 lb. nitrogen increased the gross profit by as much as \$15.52 per acre. This was where the rows were 40 in. wide.

On 14-in. spacing, the nitrogen plots were also the best profit makers. An 80-40-0 treatment produced more grain, but the added cost of the phosphorus made it less profitable.

Indications are that potash may be needed on mixed soils, but tests are not conclusive. Potash on vegetables has proved worthwhile, and this last year some farmers claim it improved cotton yields.

★

Fertilize all your avocado trees with nitrogen in the fall to tide them over the winter months and provide them with the nutrients they need when they put on a new crop of leaves in the spring. This is the advice of farm advisors and horticulturists from the University of California in Southern California.

"The nitrogen is stored in the tree and not only provides the necessary nutrients for spring blooms, but when applied to young trees in the fall the nitrates prevent leaf drop," according to C. C. Delphey, farm advisor, Ventura County.

The results of a group of nitrogen fertilization experiments on avocado trees established in six Southern California orchards in 1956 indicate that the highest yields may be obtained with a medium to high level of nitrogen in the leaves.

In four cases, the highest yields were associated with the medium rate of nitrogen, the best yield coming from a Fallbrook orchard yielding 274 lb. of fruit per tree. The average yield for the low nitrogen rate was 100 lb. Orchards were located at Fallbrook, Ventura and San Dimas, and in each experiment there were four rates of nitrogen applications (low, medium, high and extra high), each rate being replicated at least four times with four tree plots over the two-year period.

In 1955, an earlier report on avocado fertilizer experiments in two locations had indicated that highest yields were obtained with a medium level of nitrogen in the leaves. The six experiments conducted between 1956 and 1958 determine that this nitrogen-yield relationship exists in other locations and with other varieties. Four different varieties of avocado trees were tested.

★

Results of trials in irrigation of certain forage crops at the Newlands Field Station, Max C. Fleischmann College of Agriculture, University of Nevada, indicate that shallow rooted crops are not too favorably adapted to: (1) soils which are suitable and leveled for growing deeper rooted plants such as alfalfa; (2) water supplies and delivery systems as occur

in many parts of the state, and (3) water table conditions that prevail somewhat generally throughout the state.

Forage crops used in the trials were bluegrass, Ladino clover, alta fescue, strawberry clover, perennial ryegrass, Lahontan alfalfa, and tall wheatgrass. They were planted in the fall of 1955 and the harvest measured in 1957.

In pounds of forage per acre, alfalfa produced about three times as much as the short shallow rooted crops that were tested. The alfalfa also used less water than the shallow rooted crops.

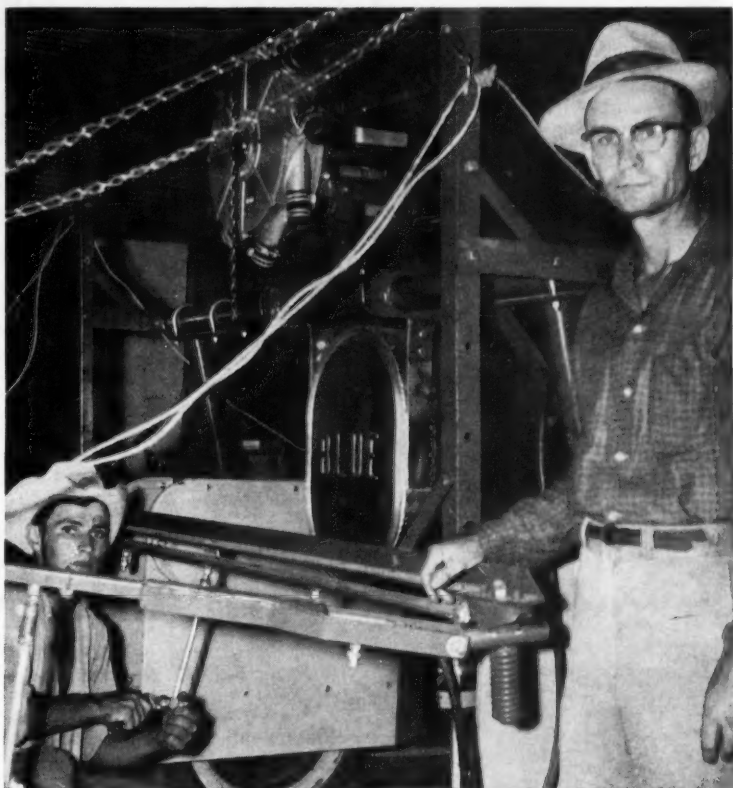
In 1956, the average application of water varied between 4.08 in. and 4.27 in. Rainfall in 1957 was less than the year before and the average application of water varied between 4.54

and 5.53 in. Results indicate that shallow rooted plants require more frequent watering with less water per application.

In these tests it was impractical to meet the irrigation requirements of shallow rooted plants because the land was leveled and the irrigation system was designed to deliver four to 6 in. of water per application.

Because of the conditions under which the trials were conducted at Newlands Station, shallow rooted plants showed a higher loss and consequently more weed infestation than the deep rooted plants.

The tests were conducted and reported by John A. McCormick, superintendent, Newlands Field Station, and Victor I. Myers, irrigation engineer, USDA collaborator.



ORLAND MOORE (right), assistant manager of Moore's Farm Supply, Selmar, Tenn., and one of the firm's employees are shown getting a tractor-sprayer ready to start on a job. The rig covers eight rows of cotton at a time, and by making a few changes can be equipped to dust insecticides on the crops. The machine grosses \$100 or more a day.

### DIRECTION

(Continued from page 9)

fertilizers," he said, "and some of this enthusiasm seems to rub off on the customers."

One advantage that Moore's Farm Supply has is that the farm chemicals can be hauled by truck from Memphis where the materials are manufactured. The firm owns two large trailer-trucks which will haul the legal limit of 27 tons, and there are also two bob-tailed trucks for short hauls and deliveries. These local deliveries are free, providing the tonnage is sufficient to justify it.

In addition, the store has developed a good business in livestock remedies, dog food, farm supplies, garden and field seed and sprayers of all types.

"One thing we noticed," said the owner, Carl Moore, "is that once a man has a feed business, he can branch into farm chemicals and general supplies with very little extra expense and trouble. He has a ready-made set of customers. A man feeding broilers or keeping dairy cattle is in the market for spraying equipment, remedies and supplies. And if he is farming, he needs fertilizer and insecticides."

Mr. Moore believes in aggressive selling. He stays on top of his business, by keeping up with markets, weather conditions, kind of crops

being grown and trends in agriculture.

"Help a man make money and he will continue to trade with you," said the farm store owner. "As I see it, the farm store dealer must recognize that farming is not always a profitable occupation. He must help farmers do a better job, to keep them on the farm. And in trying every way possible to help old John and Joe and Wilbur stay out there and make money, the dealer will be taking care of his own business."

Despite the loss of feed tonnage in feeding broilers, Mr. Moore's gross sales and profits have been bigger than ever. By selling the farmer all his farming needs, the store is now on a much sounder financial basis than at any time since Carl Moore put in his store five years ago.

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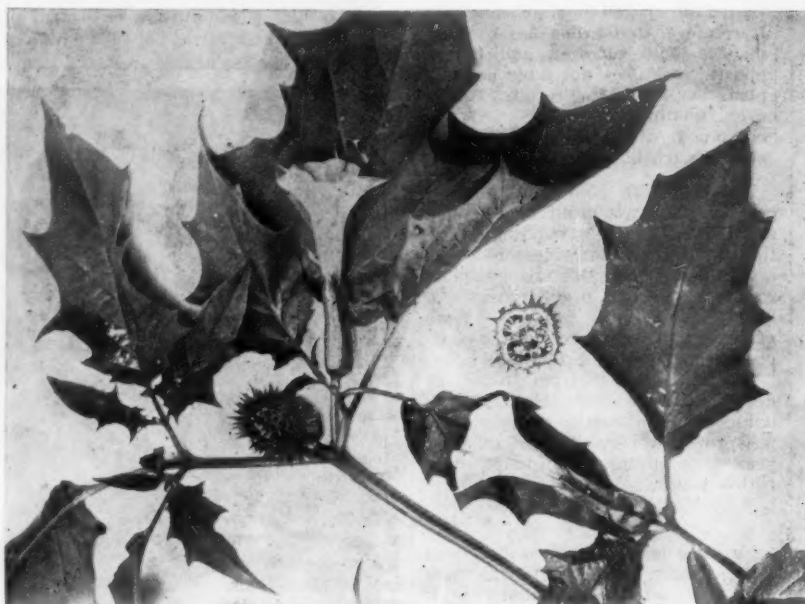
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# WEED OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board



## JIMSON WEED

(*Datura stramonium*)

### How to Identify

Jimson weeds are tall, bushy, coarse, and have a fibrous root system. They grow from one to five feet in height, and the stems are stout, branched, and green-to-purple in color. Leaves measure from 3 to 8 inches in length, with regular toothed margins. They are dark green on top and light green on the underside. Flowers are white or violet, funnel-shaped, and from 1 to 4 inches long, with the largest portion about 1½ to 2 inches in diameter. The seed pod is round, is from 1 to 2 inches from tip to bottom, and has short, stout, sharp spines over the surface. This pod is divided into four different sections that contain many flat, wrinkled, round, dark brown or black seeds. Easiest identification lies in the trumpet or funnel-shaped flower and the prickly seed pod.

### Damage Done by Jimson Weed

These unwanted plants, when eaten by either man or animals, are poisonous. This is true of all parts of the plant. Since it thrives in rich soils of gardens and in pastures, feed lots and along creeks in low areas, it is a potential or actual

trouble-maker. The weed also emits a disagreeable odor. Ordinarily, livestock will not eat this plant as such, but the animals may be poisoned by eating very small plants or some leaves when mixed with cured hay.

### Life of the Jimson Weed

The plant reproduces only by seed, and the seed may have lain dormant in the soil for a number of years before sprouting and growing. The weed appears over a widespread area of the United States, with particularly troublesome activity in the South. The plant was originally introduced from the tropics.

### Control of Weed

Jimson weeds may be controlled by either cultural or chemical means, depending largely upon the economics of the situation and whether the weed appears in crops to be used for human consumption or for feed. If chemical herbicides are used, care must be taken to check with local or state authorities as to the susceptibility of surrounding crops to the chemical, and also for information covering possible residues.



# Importance of Soil Testing Reviewed at Minnesota Meeting

By LAWRENCE A. LONG  
and JAMES L. ENGFER  
Croplife Staff

ST. PAUL, MINN. — The importance of soil tests from the standpoints of their agronomic value and as sales tools; the need for more penetrating communications to farmers; industry research; a look at fertilizer regulatory laws; and discussions on fertility programs in the Upper Midwest were parts of the Minnesota soils and fertilizer short course and Minnesota Fertilizer Industry Assn. meeting held at the University of Minnesota farm campus here Dec. 7-8.

The short course, which took place on Monday, Dec. 7, was highlighted by a talk on "Agricultural Research Adjustment in Times of Surplus," given by Dr. G. R. Browning, director, Iowa Experiment Station, Iowa State University, Ames.

Dr. Browning called for continued work despite a growing surplus of farm products, especially in the field of basic research.

"We need to find out why certain things happen. For example we should find out why a plant uses water, and why it takes up plant nutrients," he said.

Other featured topics on the program included discussions on soil testing in state and private laboratories.

John Grava, University of Minnesota soils department, opened the discussions with a talk on "Soil Test—A Link Between Farm and Agricultural Research."

R. B. Corey, University of Wisconsin soils department, spoke on "What's Behind the Soil Test Recommendation?"

Mr. Corey said, "Soil tests when properly executed are extremely useful to the farmer; in fact they are practically a necessity for a truly efficient farming operation."

He then mentioned four basic requirements for getting a good fertilizer recommendation were: A representative sample, an accurate test, an intelligent interpretation of the test and a recommendation based on research findings.

Lowell D. Hanson, University of Minnesota soils specialist, gave "A Description and Preliminary Result of a Soil Test Correlation—Demonstration Program."

"Potato Fertilization Experiments in the Red River Valley," were discussed by Dr. A. C. Caldwell, University of Minnesota soils department.

Kristian Aase, University of Minnesota soils department, spoke on

★ ★ ★

## MINNESOTA GROUP NAMES OFFICERS

ST. PAUL, MINN.—Phillip Stocker, Land O'Lakes, St. Paul, was re-elected president of the Minnesota Fertilizer Industry Assn. at the group's business meeting Dec. 8, at the end of the Minnesota Soils and Fertilizer short course held on the University of Minnesota farm campus.

The association also reelected John Coates, International Minerals & Chemical Corp., vice chairman; Robert Munson, Potash Institute of America, secretary; Ossie Arlien, Minnesota Farm Bureau, treasurer.

The following were named for two-year terms on the executive board: Richard Fancher, Welcome Agricultural Chemical Co., Welcome, Minn., and Bill Rasmussen, Northern Chemical Co., E. Grand Forks, N.D. Ray Mittness, Spencer Chemical Co., was elected to fill the remainder of the term of Ralph Willis who was recently transferred by Spencer Chemical Co. to Kansas City, Mo.

"Soil Compaction"; Herbert Findlen, U.S. Department of Agriculture, discussed the "Effects of Fertilizer on Potato Quality," and M. V. Halverson, University of Minnesota extension soils specialist, talked on "Fertilizer and Wheat Seeding Rates."

The subject of drouth and water utilization was discussed by a number of speakers. Included among these were C. J. Overdahl, University of Minnesota soils specialist, "Drouth and Fertilizer Response," and E. R. Allred, University of Minnesota agricultural engineering department, on "Irrigation Possibilities in Minnesota," and G. R. Blake, University of Minnesota soils department, who reviewed the 1959 situation and discussed the possibilities of drouth in the state in 1960.

In following sessions, Dr. Caldwell took a look at radioactive fallout and strontium 90 and its effects on plants and soils. He said that although practically nothing is known of the effects of fertility levels on absorption by plants of strontium 90 and other atomic by-products, it should prove to be a fruitful area of research that could be of considerable interest to the fertilizer industry.

J. R. Kline, University of Minnesota soils department, discussed "Non-water Soluble Potassium," and P. M. Burson, also of the university's soils department, discussed "Root Development Related to Fertilizer Placement."

Dr. J. M. MacGregor, of the soils department, in speaking on "Nitrate Poisoning Hazards and Nitrogen Recommendations," noted that reports from county agents attributed 35 animal deaths to nitrate poisoning in Minnesota. He pointed out a need for a quick nitrate test, education of the farmers as to the hazards of nitrate poisoning during drouth years and more research on the subject.

A highlight of the annual banquet held Monday evening included the presentation of a slide program on "Fertilizer Problems in Israel" by Dr. W. P. Martin, head of the university's soils department.

Appearing on the program at the Minnesota Fertilizer Industry Assn. meeting Tuesday, Dec. 8, were an agricultural economist; representatives of the American Potash and the National Plant Food Institutes; the Tennessee Valley Authority; a nitrogen supplier and a representative of the state government.

Dr. W. B. Sundquist, University of Minnesota agricultural economist, emphasized the necessity of convincing farmers of their need for using more fertilizer.

"Quite apparently, many farmers are not viewing fertilizer as a productive resource which can be readily and profitably integrated into their farm business," he said. "A big job remains in providing information as to the productivity and profitability of fertilizer both absolutely and relative to other farm inputs and expenditures. I am sure the lack of a profitable fertilizer program being used by many farm managers can be attributed to a lack of good fertilizer input-output data adaptable to their farm situation."

Edward R. Schumann, National Plant Food Institute, St. Paul, said that the use of fertilizer in Minnesota is growing "by leaps and bounds," but still only 9% of all the farmers in the area use fertilizer on either of their two most important crops at rates even approaching those recommended by their state experiment station.

He said that fertilizer merchants might correct much of this by astute use of soil tests; by employing state production charts and check lists available in Minnesota; and by conducting home farm trial or demonstration. He urged the merchants to

keep records of soil tests, recommendations, rainfall, yields and profits. This will sell fertilizer, he concluded.

Robert D. Munson, American Potash Institute, St. Paul, described the use of tissue tests as a means of determining the nutrient content of soils. Through a series of slides, he showed in detail how to make use of these materials, and what to look for in the soil, in the plant and on the tissues. Plants should be examined for possible insect damage, such as corn borer holes. Nutrient deficiency symptoms should be noted, and whether the soil is acid or alkaline should be determined.

R. E. Bergman, state fertilizer control official, told the Minnesota manufacturers that his office seeks to be of service to industry rather than playing the role of "policeman." He praised the industry as a whole for its cooperation in the past, stating that most deficiencies are corrected quickly and it has not yet been necessary to resort to court prosecution to straighten out any situation.

Mr. Bergman said that no new legislation is imminent to his knowledge.

A. V. Slack, Tennessee Valley Authority, Wilson Dam, Ala., listed a number of fertilizer products which may or may not make marks in the plant food industry in years to come. Among materials being tested at TVA are an ammonium polyphosphate 18-50-0, which he said has an advantage because it does not have to be dried in manufacture. Other items: Urea-ammonium phosphate, 30-30-0; potassium phosphates; and magnesium ammonium phosphate. The latter, he said, has worked well in Europe and has good non-burning properties.

A number of new solutions are also coming into focus, he said. So are more trace elements, suspension fertilizers and superphosphoric acid which is moving into higher ranges.

Dr. C. J. Stengel, Allied Chemical Corp., New York, emphasized the need for researching the great numbers of farmers who fail to attend helpful meetings; who don't read instructive literature and who are reluctant to listen to advice from experts on fertility. Agriculture is developing too rapidly to depend upon the next generation to adopt new practices, he said.

The most capable farmers are the ones remaining on the farms, but competition is becoming more keen all the time. He pointed out how new techniques, new concepts of crop growth and other factors have brought about profound changes in agriculture. Midwestern farmers will be feeling this competition before long. Other areas also are learning to produce corn and other basic crops economically.

## 1960 OUTLOOK

(Continued from page 1)

porters as production and consumption increase at continuing low prices."

The calendar year 1959 was a good one, according to the Commerce report. The \$24.8 billion sales figure expected for 1959 will be 7% above that of 1958 and will represent about 7% of all manufacturers' sales.

An indication of the growth of the chemical industry is seen in the expenditure of \$1 billion a year for new plants and modernization of existing facilities since 1951. Such expenditures for 1959 were over \$1.2 billion, topping other nonextractive manufacturing industries.

The Commerce report notes that chemical plants are located in every section of the country. "Factors influencing the location of plants include availability of raw materials and labor, proximity to markets, access to low-cost transportation, tax rates, local and state laws, availability and costs of power and fuel, and good quality, low-cost water supply. New facilities were constructed in all regions of the country in 1959."



M. A. Priola



Donald M. Mohr

**APPOINTMENTS**—Gelgy Agricultural Chemicals, division of Gelgy Chemical Corp., announced the appointment of M. A. Priola and Donald M. Mohr to its sales staff. Mr. Priola will serve as the firm's representative in Nebraska. Mr. Mohr will represent the company in New Jersey. Born in Denver, Colo., Mr. Priola attended Colorado State University. Prior to joining Gelgy, he was employed by Shell Chemical Corp. as technical sales representative. Mr. Mohr was born in Princeton, N.J., and graduated from Rutgers University. He formerly worked for Olin Mathieson Chemical Corp.

## Georgia Society to 'View' Customer at Meeting

ATHENS, GA. — "Our Farmer Customers—Today and Tomorrow" will be the theme of the annual meeting of the Georgia Plant Food Educational Society to be held at the University of Georgia here, Jan. 14-15.

Various aspects of the customer, including who he is, what he does and how he does it, and where he gets his information, plus what action should be taken by the fertilizer industry and the agricultural extension service, will be discussed.

Noah Langdale, Jr., president of the Georgia State College of Business Administration, will give the banquet address.



Don E. Rogers, manager of The Miller Publishing Company office in Chicago, has more than thirty years of experience in agricultural marketing . . . as a journalist, USDA advisor and representative of The Miller Publishing Company.

When you're looking for information about the grain or feed markets, call Don at Harrison 7-0515 or drop him a note at 2832 Board of Trade Bldg., Chicago 4.

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# Weed Killers, Testing, and Tolerances Described by NAC

WASHINGTON — The National Agricultural Chemicals Assn. has issued factual data sheets on weed killers, giving their background, the story of their development and outlining the many tests for safety and effectiveness which every product must undergo before being allowed on the market.

The association is making the data sheets available to the trade. Here is the text of the information sheets:

## Weeds and Weed Killers

Weeds are the thieves and gangsters of the plant world. They steal water, food and sunlight from desirable plants. Some poison livestock and cause diseases in men. One—the African witch weed—actually kills corn and other grass plants by feeding on their roots.

Weed damage turns up in big figures on the farm balance sheet. USDA estimated in 1952 that weeds cost farmers \$4 billion a year. That is nearly \$1,000 per farm family per year. One reason for this high loss figure is that many farmers are not yet controlling weeds by the most efficient methods.

Prior to 1944, the usual methods for controlling weeds in crops were machine cultivation and hand hoeing. A few chemicals were available to control weeds in a few crops, but hand weeding was the norm. The "man with the hoe" was often used as a symbol of the typical farmer, and long hours of backbreaking toil went into the use of this farm tool.

## New Herbicides Discovered

What changed the need for hand hoeing was the discovery of hormone-type selective chemical weed killers in 1944. Selective weed killers usually kill either broad-leaved weeds or grasses, but not both at the same time. Thus, it is now possible to eliminate broad-leaved weeds among grass plants or grassy weeds from among broad-leaved plants by the use of the proper chemicals. Since selective chemical weed killers were introduced to agriculture around 1947, the "man with the hoe" has been replaced as a symbol of agriculture. Today it is possible to kill as many as 20 million weeds in an hour in many crops with tractor-drawn spray equipment.

Non-selective chemical weed killers, of course, have been available for many years. With these it is possible to rid any given area of all vegetation. Non-selective weed killers have gained wide use in keeping railroad tracks, industrial areas, space around farm buildings and areas under highway guard rails clear of weeds.

Both selective and non-selective weed killers have found uses in clearing brush, weeds and even some trees from land so it can be reclaimed as pasture or for farming. Others have been developed to rid canals, ponds, irrigation and drainage ditches of aquatic weeds.

As new weed killers have come into use, weeding costs have gone down. Labor time freed from the chore of hand weeding has been put to more productive use on farms, and around the home. Maintenance of beautiful lawns and highway roadsides has been made easier. Many recreation areas have been opened up as the result of chemical eradication of poisonous plants, brush, and aquatic weeds.

## Principles Involved

The principles established for the chemical control of weeds are:

1. Identify the weeds you want to

control. If in doubt, ask your county agent or extension specialist.

2. Select the right chemical to control these weeds without harm to crops or to desirable plants near-by.
3. Mix the chemical according to mixing directions. Do not use more than recommended amounts.
4. Remember that weather conditions and the growth stage of the weeds affect the action of many weed killers. So follow directions on when and how to apply the materials.

Chemical weed killers affect plants in different ways depending upon the specific compound. Some work by contact with the surface of the weed. Others penetrate inside the weed and upset its growing processes. Some prevent germination of weed seeds, others are most effective during the weed's fastest growing period. For the first time in history man has the power to control our plant environment.

## How Weed Killers Are Safety Tested

How safe are chemical weed killers? Detailed research is carried out to determine this. And it follows logical stages.

Research on toxicity begins as soon as a compound is found to have any potential use. The earliest tests are on acute toxicity to animals and humans. For the first thing scientists must know is whether the compound is safe for use in further experiments.

If the compound passes the early tests for safety and effectiveness, safety research goes into a new stage. It discovers what kind of mammalian injury might be expected from exposure to significant amounts of the compound over an extended period of time. These studies are known as 90-day feeding tests. They are conducted on laboratory animals. Minute studies are made of the animals to determine what effects, if any, the compound has on organ systems and the skin. This provides information to be needed during manufacturing and handling of the material.

When field testing begins, extensive studies are made of residues, if any, which are left on food crops. At the same time studies are made of biological effects on mammals. These determine whether the chemical is absorbed into the body, how much is absorbed, and what effects it has, if any.

The final step in evaluating a new weed killer involves large scale field testing. Long term toxicity tests are carried on at the same time. These are carried out on a variety of laboratory animals and continue over the normal life span of the animals. Test animals are observed constantly to determine absorption, excretion, and any biological changes that may occur. Such testing may run two or three years or more.

During this lengthy period many different scientists have tested the compound and have learned what happens when the material is inhaled, when it touches the skin, when minute amounts of residues are consumed. These are tough tests for the compounds. And many more are flunked out at the different stages of research than are promoted to advanced stages of study.

On the average from 300 to 2,000 different compounds must be tested for every new chemical weed killer which is found. Finding the one

chemical which will do a better job is more challenging than finding a needle in a haystack. And it is much more expensive. Three to five years goes into the search to find a single new weed killer. The cost ranges from about \$700,000 per new chemical in a few cases to \$1,500,000 or more in most cases.

## FDA Sets Tolerances

When a chemical weed killer is to be used on food crops, all the data collected over three to five years work is checked by Federal Food and Drug Administration scientists against work done in their own FDA laboratories.

Then a safe level for residue of the chemical (tolerance) which may remain on a crop at the time of harvest is set by FDA. If the amount of residue left on a crop by good agricultural practice is less than the safe level as is often the case, the lower level is established as the legal level of residue that may remain in or on a crop.

The tolerance level may be 100 parts per million, or it may be as low as 1/10th part per million, de-

pending upon the scientifically established effect of the chemical. 1/10th part per million is equal to the thickness of a strip of cellophane compared to the height of the Washington Monument.

No products in use in the world today—not even pharmaceuticals—are more thoroughly tested before they are sold or used. And the result of all this research is available for everyone to read—on the labels of the containers.

Nothing is left to chance. All the testing and checking is done before the product is put on the market.

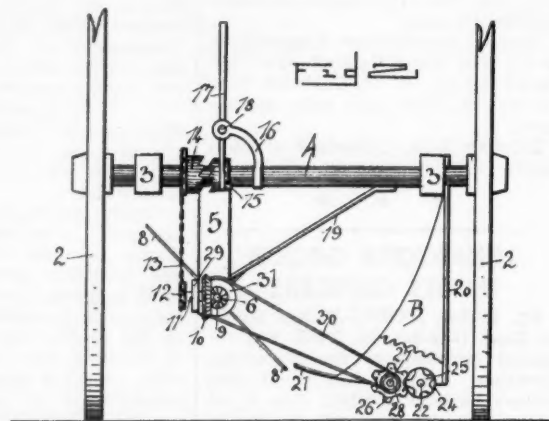
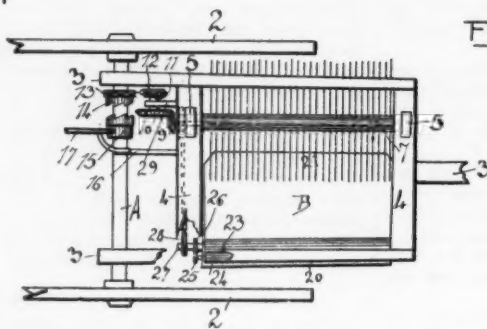
## Agronomy Meetings Set For Virginia Communities

BLACKSBURG, VA.—The agricultural extension service of Virginia Polytechnic Institute has announced schedules of state-wide agronomy meetings to be held at six locations during the month of January.

Here are the dates and places on the agenda: Jan. 14—Daw Theater, Tappahannock; Jan. 15—Gloucester High School, Gloucester; Jan. 19—Municipal Building, Culpeper; Jan. 20—Woodstock Christian Church; Jan. 21—Virginia House Restaurant, Lexington, and Jan. 29—National Guard Armory, Chatham.

Each meeting will begin at 10:00 a.m. and will adjourn about 3:30 p.m. All will be public meetings with dealers and farmers invited.

## Saga of Insect Pest Control



SHORTLY AFTER the turn of the century, two Nebraska inventors, Hans H. Sieh and Christian Holstein, alarmed at seeing potato bugs destroy crops year after year, patented a potato bug crusher designed to destroy the destroyers. Object of the invention, the patentees said, was to "provide a device which will be adapted to be carried through a potato patch and be arranged to brush and knock off the potato bugs, which are thrown into the receptacle, at the bottom of which they collect and where they are crushed and killed, the remains dropping through the rollers to the ground."

In the drawings, Figure 1 shows the sliding clutch collar on axle A. The clutch may be thrown backward and forward to operate the sprocket wheel which activates the crushing rollers, gears and other moving parts.

A brush is utilized to sweep the doomed bugs into the machinery wherein they are ground into bits. The entire rig is pulled by either a horse or a team. The wheels shown in the illustration are ordinary wagon wheels, the patent indicates.



## Georgia Agriculture Commissioner Starts Quarantine Measures Against Black Shank

ATLANTA, GA.—Because of the serious threat of black shank disease to the production of quality tobacco in Georgia, Phil Campbell, commissioner of agriculture, has announced establishment of quarantine measures to guard against the spread of the disease in Georgia tobacco fields.

In a statement made in a recent issue of the Market Bulletin, Mr. Campbell said that "under the quarantine regulations recommended by a special committee of the legislature appointed to study the problem, tobacco production will be temporarily discontinued on all land in Georgia known to be infested with black shank."

Infested land, either beds or fields, will be planted to non-susceptible crops for a period of not less than five years, Mr. Campbell said. Farms having infested land and not sufficiently large enough to practice such a rotation program but topographically adapted to prevent contamination of other land may continue tobacco production on non-infested land selected by inspectors from the Department of Agriculture. Under such conditions, however, only disease resistant varieties may be planted.

Mr. Campbell wrote further that "In addition to the regulations on land use, all machinery used in custom work (tobacco harvesters, sprayers, transplanters, fumigation equipment, irrigation equipment, etc.) will be allowed to enter and leave infested farms only with the consent of area inspectors. In addition such machinery must be cleaned and sprayed with fungicides under direction of the inspectors.

"Area inspectors will also have authority over movement of animals to and from infested fields and farms and authority over movement of labor as well as the use of irrigation water

from common sources in infested areas and the production of susceptible plants on infested farms.

"All susceptible plants produced on infested farms must be used only on that farm on which they are produced and plant beds must be destroyed as soon as possible after production."

### Leaflet Available

WASHINGTON—The availability of a leaflet, "Lime Means More Money For You," from the National Plant Food Institute has been announced by Russell Coleman, executive vice president.

The leaflet is a reduced version of a large poster published recently by NPFI at the request of the Southeastern Industry Advisory Board.

## IMC Names R. J. DeLargey To Newly-Formed Post

CHICAGO, ILL. — International Minerals & Chemical Corp. has announced the appointment of R. J. DeLargey as vice president, administration, a new position.

Mr. DeLargey comes to IMC from Food Machinery & Chemical Corp., where he was general manager of the Westvaco Chlor-Alkali Division, with headquarters in New York.

T. M. Ware, IMC president, said Mr. DeLargey would be directly responsible for the company's industrial relations, purchasing, legal and industrial engineering departments.

Mr. DeLargey had been with Food Machinery & Chemical Corp. since 1951. He was for three years resident manager of the Westvaco Division's heavy chemical plant in Charleston, West Virginia, and also served as director of engineering on design and construction projects for the chemical divisions, assistant di-

vision manager on production and development, and assistant to the operating vice president.

He had previously been with Shell Chemical Corp., New York, and McGean Chemical Co., Cleveland, in technological and plant management positions.

### ALABAMA FERTILIZER SALES

MONTGOMERY, ALA.—Fertilizer sales in Alabama during October, 1959, amounted to 38,713 tons, or 20,912 tons less than the same month in 1958, reported R. C. (Red) Bamberg, commissioner, Alabama State Department of Agriculture and Industries, division of cooperatives and reports.

### ASSISTANT CONTROLLER

LOS ANGELES—Kenneth L. Magnuson has been appointed assistant controller of U.S. Borax & Chemical Corp., announced Richard F. Steel, vice president for administration.



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**EMBLEM**—Registrants at the recent Detroit joint meeting of the Entomological Societies of Ontario, Canada and America became acquainted with the above emblem which links symbols of American and Canadian entomology, marking the first joint meeting. The torch and stylized insect is derived from the Entomological Society of America. The maple leaf arrangement is from the emblem of the Tenth International Congress of Entomology at which Canadian entomologists were hosts. The Detroit meeting was hailed by entomologists of both nations as being one of "historic significance."

## Missouri Dealers Receive Tips At First Fertilizer Sales Clinic

COLUMBIA, MO.—Tips on selling, how to organize for a profit and dealer problems were a few of the subjects discussed at the Fertilizer Sales Clinic held at the University of Missouri on Dec. 1.

This was the first such clinic ever held in Missouri. Reaction of the 135 dealers, salesmen and others who attended was that it was an event packed with information they can use. And many asked that a similar sales clinic be held again next year.

"There is not a surplus of fertilizer materials, there is a surplus of markets," said Jere Wise, marketing section, Spencer Chemical Co., Kansas City, in a talk about services dealers can offer to their consumers.

"I know of no other industry that possesses a greater sales potential than the fertilizer industry," Mr. Wise continued. "Many farmers are using no fertilizer, not because they don't need it, but because they have never been sold on commercial plant food."

Other farmers use only teaspoon quantities of fertilizer. All these farmers, are potentially a big market for fertilizers, Mr. Wise said.

Mr. Wise warned against selling on price. Instead, fertilizer should be sold on quality of product, savings of land and labor, and security from being pushed off the farm by inefficient farming practices. A dealer can sell

services, sell added profits from using fertilizer, or sell the prestige of having a nice green corn field by the side of the road. Or a dealer can sell fertilizer performance or fear of crop failure from lack of plant nutrients.

Those appearing on the Sales Clinic program included both fertilizer industry representatives and dealers, plus college specialists.

Making use of motivation in selling was discussed by Robert Callis, director of testing and counselling at the University of Missouri. He said man is motivated by a desire to fill his needs. These needs can be arranged in order of power.

The most powerful need is self-preservation. It is followed by another biological need, the need for reproduction of the species (marriage and family).

After these two basic needs have been filled, man next attempts to fill psycho-social needs. These include belongingness and love in a family or group; self-respect and feeling of personal worth; self-expression in hobbies or abilities; and esthetic experience through art, music or landscaping.

Mr. Callis said that a person is always ready to move to the next need as soon as one is filled. A starving man has no interest in listening to a symphony but a well-fed man may enjoy it. A marginal farmer has no interest in landscaping his front lawn but he may be interested in producing more corn per acre.

What does this mean to the salesman? Mr. Callis said the salesman must determine what need his potential customer is trying to fill. Sometimes a salesman pitches his sales campaign on his own needs rather than those of the customer. By studying his customer, the salesman can determine which pitch will most likely motivate his customer to buy.

"I dare you to be different," was a challenge thrown at those attending the Sales Clinic by another University of Missouri professor.

Raymond Lansford, marketing specialist, advised, "Do something that is constructive, interesting and valuable to your consumers. If you let selling come naturally as it should, your appreciation for people, your products and your community will grow. The enthusiasm you show is catching."

"Are your sales made only in the store?" Mr. Lansford asked. "Or are you subconsciously making sales and creating good will by the in-store and outstore relationships that you build with the community?"

The marketing specialist noted that in some cases, the initial sale of a product is only the beginning. What a customer says and does during the period from the time the product is used until harvest can have an effect on future sales in the community. The dealer needs to keep an eye on what is happening.

Another industry representative, V. L. Sheldon, agronomist, Olin Mathieson Chemical Corp., St. Louis, said another challenge lies in finding courage to break with traditional merchandising methods.

No farmer really wants fertilizer, Mr. Sheldon said. Instead, he wants a trip to Florida or some other such thing. This means dealers must sell the benefits farmers will get from fertilizer, instead of selling the fertilizer itself.

"A strong educational program is our best method of showing these benefits," Mr. Sheldon said. "You, as salesmen, can well afford to teach. To do so you must become so full of the benefits of plant food that they spill out in your every conversation."

In another part of the program, a panel of three Missouri dealers discussed their problems. On the panel were Clyde Brown, Soil Service, Ladonia; Frank Hoffman, Hoffman & Reed, Trenton; and Murray Renick, Rolla Feed Mills, Inc., Rolla. Panel

moderator was Jim Gille, Phillips Petroleum Co., Kansas City.

Mr. Brown noted the need for a good set of books. He recommended a daily sales breakdown by departments, a monthly profit and loss statement and a net worth statement annually.

Mr. Brown also mentioned taking part in community activities offered by church and civic groups. Cooperation with agricultural agencies and even competitors can be useful, he said.

Problems of pricing were discussed by Mr. Hoffman. Two difficulties in setting a selling price, according to Mr. Hoffman, are lack of dealer setup by some of the industry, and truckers returning from market using fertilizer as a back haul only. Mr. Hoffman also brought up the complications caused by the vast number of grades and mixes.

One of the first points stressed by Mr. Renick was the need for well-trained loyal employees. He said an incentive plan will stimulate employees to sell more merchandise and services.

The next essential Mr. Renick mentioned was to have a well-lighted, well-decorated salesroom with adequate stocks on hand.

The Sales Clinic was sponsored by the Soil Fertility and Plant Nutrition Council of Missouri, the Agricultural Extension Service, and the University of Missouri's division of continuing education.

Plans and arrangements for the event were made by a committee composed of George Wickstrom, American Potash Institute, Columbia, Mo.; Dick Balser, Spencer Chemical Co., Kansas City, and John Falloon, University of Missouri extension soils specialist.

## Hercules Planning Expansion of West Coast Facilities

WILMINGTON, D E L. — Hercules Powder Co. has announced plans for a multi-million dollar expansion of its West Coast facilities at Hercules, Cal. The expansion includes the construction of new manufacturing facilities for the production of methanol, formaldehyde, urea-formaldehyde concentrates, and slow nitrogen release urea-form for fertilizer applications.

John M. Martin, general manager of Hercules explosives department, said that construction of the new facilities for producing the urea-formaldehyde compositions would be completed by mid 1960, with methanol-formaldehyde facilities completed in early 1961.

The new construction will provide facilities for the production of 8,000,000 gallons of methanol per year, 50 million pounds of formaldehyde, and 11,000 tons of urea-formaldehyde compositions.

The new facilities will be operated by the explosives department of Hercules, and will establish the Hercules plant as one of the most diversified chemical operations on the West Coast. The present plant produces industrial explosives, anhydrous ammonia, nitric acid, ammonium nitrate solutions, grained ammonium nitrate, urea, urea-ammonium nitrate solutions, and nitrogen tetroxide (an oxidizing agent for rocket fuel).

### EXTRA DIVIDEND

NEW YORK—The board of directors of Commercial Solvents Corp. has declared an extra dividend of 5¢ per share of common stock. At the same time, the board voted a regular dividend of 5¢ per share for the fourth quarter. In addition, CSC's board announced a two percent stock dividend on its 2,741,422 issued shares of common stock. The total cash dividend of 10¢ per share, and the stock dividend, will be paid on Dec. 31, 1959, to stockholders of record at the close of business on Dec. 4.



SCENES FROM MISSOURI CLINIC—The top photo shows the panel that discussed dealer problems at the Fertilizer Sales Clinic at the University of Missouri. Panel members were, left to right, Murray Renick, Rolla Feed Mills, Inc., Rolla, Mo.; Frank Hoffman, Hoffman and Reed, Trenton, Mo.; Jim Gille, Phillips Petroleum Co., Kansas City, Mo.; and Clyde Brown, Soil Service, Ladonia, Mo. In the middle photo V. L. Sheldon, agronomist, Olin Mathieson Chemical Corp., St. Louis, explains one of the visuals he used in his presentation at the Fertilizer Sales Clinic. On his left is Austin Mount, Davison Chemical Co., Joplin, Mo., past president of the Soil Fertility and Plant Nutrition Council of Missouri. On the right are Jere Wise, marketing section, Spencer Chemical Co., Kansas City, and John Falloon, extension soils specialist, University of Missouri. The bottom photo is of the officers of the Soil Fertility and Plant Nutrition Council of Missouri for the coming year. They are, left to right, George Wickstrom, agronomist for the American Potash Institute, Columbia, vice president; Robert Wels, fertilizer sales manager, Virginia-Carolina Chemical Corp., St. Louis, president, and Frank Hoffman, co-owner, Hoffman and Reed Supply, Trenton, secretary-treasurer.





DR. W. A. ALBRECHT (second from right), a long-time soils researcher and teacher at the University of Missouri, was presented a book of letters from friends and fellow-workers at a banquet held in his honor. Dr. Albrecht retired as chairman of the University's soils department this year after 21 years in that position. Presenting him with the book is M. F. Miller (second from left), dean emeritus of the college of agriculture. On the far left is R. W. Scanlan, Phillips Petroleum Co., Bartlesville, Okla. On the right is Paul Truitt, National Plant Food Institute, Washington, D.C.

## Dr. W. A. Albrecht, Veteran Soils Teacher, Honored at Missouri Recognition Banquet

COLUMBIA, MO.—A veteran soils researcher and teacher was honored recently at a recognition banquet at the University of Missouri.

Some 300 former students, farmers, fellow researchers and friends gathered Dec. 2 to pay tribute to Dr. W. A. Albrecht, who retired as chairman of the university's soils department Aug. 31, 1959. The banquet was held in connection with the annual Soil Fertility and Plant Nutrition Short Course.

Dr. Albrecht served as department chairman for 21 years. He first joined the Missouri soils staff as an instructor in 1916. During the past 43 years, he became internationally known for his work on soils and soil fertility.

As a part of the recognition ceremonies, Dr. Albrecht was presented a bound book of letters from friends and associates. The presentation was made by M. F. Miller, dean emeritus of the college of agriculture, who was chairman of the soils department when Dr. Albrecht joined the staff.

In another presentation, a \$2,700 lecture fund was given to the university in honor of Dr. Albrecht. The fund, contributed by individuals and organizations, will be used to bring outstanding soils scientists to the campus each year for special programs.

Speaking for the fertilizer industry, Paul T. Truitt, executive vice president of the National Plant Food Institute, Washington, D.C., said Dr. Albrecht has helped the fertilizer industry supply farmers the type of fertilizer they need. He also noted that if researchers such as Dr. Albrecht

had not searched for ways to improve soil fertility and crop production during the period prior to 1940, the world would not have fared as well as it did during the emergencies of the past two decades.

In a short response by Dr. Albrecht, he said he plans to continue his research and writing on soils and related fields. He also said he intends to find out if leisure time is as desirable as it would seem to be when things are pressing.

### Chapman Names New Executive Vice President

MEMPHIS, TENN. — Robert C. Harnden has been named to the newly created post of executive vice president of Chapman Chemical Co., Memphis manufacturer and distributor of wood preservatives, agricultural and industrial chemicals.

Dale Chapman, president, announced the appointment. Mr. Harnden has been vice president in charge of the company's agricultural chemicals division since 1950.

A native of Michigan, Mr. Harnden was graduated from the University of Michigan in 1937 with a Bachelor of Science degree in chemical engineering, and joined The Dow Chemical Co. that year. After serving as manager of the Dowicide sales division, he joined Chapman in 1946 to take charge of research and plant operations.

Mr. Harnden organized Chapman's agricultural chemicals division in 1948 and has headed the division since that time.

### Program Plans Told For Iowa Conference

AMES, IOWA — Program plans were announced for the 12th annual Fertilizer Industry Representatives' Conference, to be held Jan. 6, at the Memorial Union on the Iowa State University Campus in Ames.

Theme of the morning session will be "Focus on Knowledge." Included in the discussions to be presented are such subjects as: "Speeding Up Residue Decay and Building Up Organic Matter," "Which Form of Nitrogen for Plants and Soil Micro-Organisms?" and "Research Data Can Be Misinterpreted."

The afternoon session will revolve around the theme "Fertilizer Industry in a Changing Agriculture." Highlights of the afternoon will be talks on "The Impact of Fertilizers on Cropping Systems," "Agronomic Research and Agriculture Adjustment," "The Fertilizer Industry and Agriculture Adjustment" and "What Do You Know About Your Fertilizer Dealer?"

## CHEMICALS MAY TAME WILD OATS

WINNIPEG, MAN., CANADA — Recommendations for two chemical products to control wild oats in various crops were made at the Central Canada and North Central Weed Control Conference held here last week. The recommendations were made by the Western Section of Canada's National Weed Committee for "Avadex", made by Monsanto Chemical Co., St. Louis, Mo., and "Carbyne", made by Spencer Chemical Co., Kansas City, Mo.

Avadex was recommended for trial use in pre-planting application for control of wild oats in flax, barley, rape, sunflower and sugar beets.

Carbyne was recommended for trial use in wheat, barley, sugar beets and rape.

Application has been made for Canadian registration and sale of the products in 1960. Extensive tests have been made in both the U.S. and Canada during the past several seasons and all data has been submitted for final approval.

Wild oats have ranked for years as Canada's most serious weed problem, costing an estimated \$125 million annually—more than \$500 per farmer. In some 20 million acres seriously infested with the weed, crop yields are reduced by as much as one-third to one-half and more. There has been no satisfactory means of controlling the weed.

The wild oat (*Avena fatua*) is an ancient weed, known to grain growers in Greek and Roman times. It is believed to have immigrated to North America in the 19th century with the settlers of western Canada. Wild oat pollution in small grains prompted legislative action by Manitoba's Assembly in 1883.

The weed now infests more than 60 million cultivated acres in the Great Central Plains area including the Canadian provinces of Alberta, Saskatchewan, Manitoba and bordering United States. It is most widespread in Canada where it infests approximately three-fourths of all cropped acreage in the three prairie provinces.

Almost half of the total reported infestation of wild oats is rated by agricultural authorities as serious, causing marked reductions in crop yields. Experiments conducted at the University of Saskatchewan showed that heavy infestations of wild oats reduced flax yields 84%, wheat yields 33% and those of barley, the best competitor, 15%.

Weeds are estimated to cost Canadian farmers more than \$250 million each year. Wild oats are reported to account for one-half of this total cost.

## CIPPERLY

(Continued from page 1)

with wide experience in the chemical field are attacking problems from the technical side after field experience, quite in contrast with Secretary Flemming's broad axe approach in the cranberry incident. His blanket indictment of the cranberry producers and the producers of the weed killer before a synthetic press conference was reminiscent of a rigged TV quiz show.

In its usually calm scientific approach to chemical and agricultural industry problems, USDA has this further to say about research in the area of weed control in the seed industry:

"Other important research needs include study of the basic physiology of legume, grass, and vegetable seeds and study of the basic physiological processes involved in vegetable seed germination," the committee said.

"In regard to the physiology of legume, grass, and vegetable seed, the committee noted a need for studying effects of temperature, light, nutrition, and their interactions on seed development. Special emphasis in the germination investigations, according to the committee, should be put on the influence of light, temperature, water, chemicals, and other factors affecting germination.

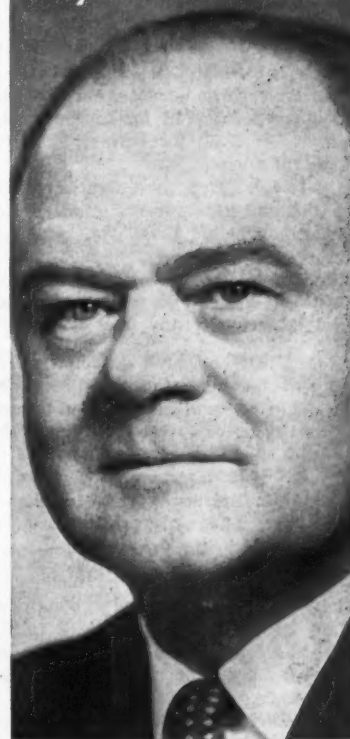
"Plant breeding research to develop legumes and grasses with improved seed characteristics and resistance to shattering during harvesting is also needed, according to committee members."

Dr. D. D. Hill, formerly head of the farm crops department at the Oregon agricultural experiment station, Corvallis, and committee chairman, presided. J. Bernell Harlan, Woodland, Cal., seed producer, was named chairman for next year.

Other members who attended were: Clarence L. Benson, beekeeper and honey producer, Phoenix, Ariz.; Sam Frantz, seed producer, Dublin, Ohio; Ralph D. Henson, manager of the seed procurement division of a farm cooperative, Buffalo, N.Y.; Arden Jacklin, co-owner of a seed processing firm, Dishman, Wash.; Dale H. Johnston, president of a seed producing firm, Enid, Okla.; John W. Matrys, executive vice president of a seed trade association, Monterey, Cal.;

Donald M. Murphy, vice president of a seed producing firm, Twin Falls, Idaho; W. T. Molin, grass and legume seed producer, Hamburg, La.; and Walter Peirce, seed producer, Hutchinson, Kansas.

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## PRODUCTION

(Continued from page 1)

Output of fertilizer grade ammonium nitrate, original solution, was 245,478 short tons for September, compared with 230,166 short tons for August, and 217,017 short tons for September last year.

September's ammonium sulfate production was 96,087 short tons, or slightly higher than August, and September, 1958.

Production of nitrogen solution (including combination with urea) was 68,248 short tons, or 16,033 short tons more than August, 1959, and 12,941 short tons more than September, 1958.

Phosphoric acid output was 153,370 short tons, slightly less than August, but substantially higher than the same month last year.

Sulfuric acid tonnage in September was 1,332,794 short tons. This compares with 1,310,875 short tons in August, and 1,262,589 short tons in September a year ago.

# Croplife

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Western states.

## Increased Profit Along With Better Yield Promises Continued Sales of Fertilizers

THE ROLE of fertilizer in the production of ample supplies of feed grains was recognized in a talk by Orlin J. Scoville, chief of the costs, income and efficiency research branch, USDA, before the 37th annual agricultural outlook conference held recently in Washington, D.C.

Fertilization of feed crops and pasture accounts for 52% of all plant food used, he stated, and this extensive use has come up rapidly in late years. From 1947-1954, the amount of nitrogen used on corn, oats, and barley increased by 208%. The increase for  $P_2O_5$  was 55% and for potash, 148%.

In 1954, fertilizers were applied on 60% of the corn, 31% of the oats, 27% of the barley and grain sorghums and only 18% of soybeans. At 1954 fertilizer rates and with the crop yields of that year, it is estimated that use of fertilizer was responsible for increases in yield as follows: 23 bu. an acre of corn fertilized; 19 bu. an acre for oats; 13 bu. an acre for barley; almost 8 bu. an acre for soybeans and grain sorghums and 16.5 bu. for wheat. These increases in yield reflect improvements in other practices, too, but the application of plant food is acknowledged to be of most importance.

Although statistics for later years on the amount of fertilizer used for each crop are not available, it is known that there have been further increases in rates of application per acre and in the proportion of acres fertilized.

How about the economics of applying fertilizers to these feed grain acres? Are the farmers spending too much for plant food products, thus making their feed too expensive? Hardly. Here are further statistics brought out by Mr. Scoville in discussing this portion of the situation:

"It is estimated that in 1954, the marginal return for each dollar spent for fertilizer was about \$3.00 for corn; \$2.27 for soybeans, \$1.55 for grain sorghums; \$1.62 for barley; \$1.44 for oats; and \$2.26 for wheat.

"As calculated, these figures reflect the average of the marginal returns realized by farmers in general including those who applied fertilizer liberally and those who applied very little. With these favorable returns, a substantial increase in fertilizer use and in output per acre can be expected for feed grains, and particularly for corn."

USDA research economists have stated that by 1965, the average yield of corn might be as much as 59 bu. an acre if 75% of the acreage were fertilized at the average rate of 60 lb. nitrogen an acre. This rate of fertilization would give an estimated marginal return of \$2.00 for each \$1 of fertilizer under the price-cost conditions assumed in the projection.

Lest anyone should be inclined to shrug off the above statistics and projections as being a little on the "dreamy" side, it might be well to note the comments of a prominent banker on the general subject of rangeland fertilization, a kindred topic.

J. Earl Coke, vice president of the Bank of America, San Francisco, told a California group not long ago that benefits from rangeland fertilization in his state are numerous. "One recent example," he said, "shows an increase in forage production on fertilized land that was three times that of the unfertilized plots.

"It was reported that in addition to the heavier growth of forage resulting from fertilization, the fertilized acreage provided a longer grazing period, more growth during periods of lower temperatures and, because of the heavier sod, less cutting of the land when pastured in wet weather. These results were not mere guesses but were from carefully conducted field tests in which

results from fertilized and unfertilized acreages were compared.

"This kind of information is, of course, the first essential in determining if expenditures for fertilizers prove to be a good investment either from the farmer's point of view or that of the banker providing credit. But the analysis should not stop there. In addition to determining that the practice of fertilization of rangeland will, in fact, increase forage production, it is important to know that this increased forage will be utilized in such a way as to result in increased returns at least sufficient to justify the costs involved. It is not sufficient to determine only that fertilizers will increase the quantity or quality of forage, it must also be determined if this forage can be utilized and profitably marketed in the form of meat or dairy products.

"Therefore, from the banker's point of view, rangeland fertilization should be looked at as one factor in the over-all management decisions and practices. It may involve financing additional cattle, additional supplemental feeds, additional pharmaceutical products, or whatever it takes to readjust the livestock enterprise to fit into this greater supply of feed.

"In many instances the additional feed produced as a result of fertilization is a rancher's cheapest feed. However, range forage production is completely dependent on natural precipitation which, in California, is highly variable with respect to both quantity and time.

"Consequently, a successful management of fertilized ranges in California requires a high level of management skills to meet the situation arising when precipitation is limited or poorly timed. Just because range fertilization, or any other management practice, promises to increase physical output is not a sufficient reason to consider it favorably. One must consider how this practice fits into the over-all management scheme.

"If range fertilization permits a rancher to eliminate one of his bottlenecks to achieving an expanded and coordinated operation, the gains to management might be much greater than indicated merely by the expected increase in forage. Conversely if this increased forage merely adds to the bottleneck pressures elsewhere, it might even have a negative value unless certain management changes could be made. In the long run, improvement in returns can be expected to result from the use of these practices."

## Big Table

A GRAPHIC PICTURE of the unending need for food to keep the world going was presented in a recent issue of "Scan," put out by Shell Chemical Corp. "Suppose all the people of the world could sit down at one table for a meal. How long would that table have to be?" the item asks.

"If we allow two feet of space for each person and have seats on both sides of the table, we would need one foot of table length for each person. For the 2,691,000,000 persons in the world (1955 count), the table would need to be long enough to extend nearly 21 times around the world at the equator. But each day we would have to make the table even longer. Because the world's population is expected to increase at the rate of approximately 50 million persons a year during the quarter century from 1950 to 1975, the table would have to be lengthened 9,470 miles a year—about 26 miles every day. And it'll take a whale of a lot of healthy foodcrops to keep that table laden with goodies."



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EXECUTIVE AND EDITORIAL OFFICES—2501 Wayzata Blvd., Minneapolis, Minn. Tel. Franklin 4-5200. Bell System Teletype Service at Minneapolis (MP 179), Kansas City (KC 295), Chicago (CG 340), New York (NY 1-2452), Washington, D.C. (WA 82).

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## MEETING

## MEMOS



Jan. 5-6—12th Annual Fertilizer Industry Representatives' Conference, Memorial Union, Iowa State University, Ames, Iowa.

Jan. 6—Southwest Research and Education Committee meeting, Texas A&M College, College Station, Texas.

Jan. 7-8—Fourth Georgia Structural Pest Control Operators' Short Course, University of Georgia, Athens.

Jan. 14-15—Beltwide Cotton Production—Mechanization Conference, Peabody Hotel, Memphis, Tenn.

Jan. 14-15—Annual meeting of Georgia Plant Food Educational Society in conjunction with Georgia Section, American Society of Agronomy and Soil Science Society of America, University of Georgia, Athens.

Feb. 3-4—Illinois annual fertilizer industry conference, University of Illinois, Urbana.

Meeting Memos listed above are being listed in this department this week for the first time.

Jan. 5-6—Annual Texas Fertilizer Conference, College Station, Texas.

Jan. 6-7—Wisconsin Pesticide Conference with Industry, Wisconsin Center Bldg., University of Wisconsin, Madison, Wis.

Jan. 6-8—14th Annual Meeting, Northeastern Weed Control Conference, Hotel New Yorker, New York City.

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Jan. 7-8—Colorado Fertilizer Conference, Fort Collins, Colo.

Jan. 7-8—Sixth Annual Mississippi Insect Control Conference, in conjunction with annual meeting of Mississippi Entomological Assn., Mississippi State University, State College, Miss.

Jan. 11-14—Kansas Fertilizer Dealer Meetings: Jan. 11, Hiawatha; Jan. 12, Lawrence; Jan. 13, Abilene, and Jan. 14, Belleville.

Jan. 12-13—Thirteenth Annual Meeting of the Ohio Pesticide Institute, Lincoln Lodge, Columbus, Ohio.

Jan. 12-13—Nebraska Fertilizer Institute annual convention, Pershing Auditorium, Lincoln, Neb.

Jan. 13—Georgia Plant Food Educational Society, University of Georgia, Athens, Ga.

Jan. 13—New Mexico Agricultural Chemical Conference, third annual meeting, Milton Hall, New Mexico State University, University Park, N.M., Dr. J. Gordon Watts, chairman.

Jan. 13-14—Pesticide School, North Carolina State College, Raleigh, N.C.

Jan. 13-15—Ninth Annual Convention, Agricultural Ammonia Institute, Statler Hilton Hotel, Dallas, Texas.

Jan. 13-15—Virginia Polytechnic Institute Agronomy Schools: Jan. 13, Culpeper; Jan. 14, Tappahannock; Jan. 15, Gloucester.

Jan. 14-16—10th Annual Convention of the Agricultural Aircraft Assn., El Mirador Hotel, Palm Springs, Cal.

Jan. 19-21—Twelfth Annual California Weed Conference, Sacramento, Cal.

Jan. 20-21—Third Annual Arizona Fertilizer Conference, University of Arizona campus, Tucson, Ariz.

Jan. 20-21—North West Agricultural Chemicals Industry Conference, Benson Hotel, Portland, Ore., C. O. Barnard, executive secretary.

Jan. 20-22—Thirteenth Annual Southern Weed Conference, Buena Vista Hotel, Biloxi, Miss.

Jan. 21—Northeast Region, National Plant Food Institute fertilizer sales promotion workshop, Hotel Hershey, Hershey, Pa.

Jan. 25—Wisconsin Lime and Fertilizer Day, University of Wisconsin campus, Madison, Wis.

Jan. 25-26—Second Annual Agricultural Pesticide Conference, Purdue University, Lafayette, Ind.

Jan. 25-27—Cotton States Branch, Entomological Society of America,

DeSoto Hotel, Savannah, Ga.

Jan. 26-27—South Dakota Fertilizer Dealers Short Course, South Dakota State College, Brookings, S.D.

Jan. 27-28—Annual Illinois Custom Spray Operators' Training School, University of Illinois, Urbana, Ill.

Jan. 27-29—Symposium on Chemistry of Phosphate-Soil Reactions, Muscle Shoals, Ala.

Jan. 28-29—Annual meeting of the Colorado Agricultural Chemicals Assn., Cosmopolitan Hotel, Denver, Colo.

Feb. 2-4—Pest Control Operators' School, North Carolina State College, Raleigh, N.C.

Feb. 4—Executive Committee Meeting, National Safety Council, Fertilizer Safety Section, New Florida Hotel, Lakeland, Fla.

Feb. 8-9—Southwestern Branch, Entomological Society of America, Hilton Hotel, El Paso, Texas.

Feb. 8-9—Twenty-Second Annual Meeting, National Cotton Council of America, Statler-Hilton Hotel, Dallas, Texas.

Feb. 9-11—Seventh Annual Agricultural Chemicals Conference, Texas Technological College, Lubbock, Texas.

Feb. 11-12—Midwest Agronomists-Fertilizer Industry meeting, Edgewater Beach Hotel, Chicago, Ill.

Feb. 17-18, 23-25—Indiana Ammonia Service School; Feb. 17, Lafayette; Feb. 18, Bedford; Feb. 23, Valparaiso; Feb. 24, Ft. Wayne; Feb. 25, Muncie.

Feb. 17-18—Pest Control Conference, Alabama Polytechnic Institute campus, Auburn, Ala. Sponsored by A.P.I. and the Alabama Association for Control of Economic Pests.

Feb. 22-25—Weed Society of America meeting, in conjunction with Western Weed Conference, Cosmopolitan Hotel, Denver, Colo.

March 22-23—Western Agricultural Chemicals Assn., spring meeting, Miramar Hotel, Santa Barbara, Cal.

March 23-25—North Central Branch, Entomological Society of America, Schroeder Hotel, Milwaukee, Wis.

March 30-31—Twenty-fourth annual meeting, Georgia Entomological Society, New Science Center, University of Georgia, Athens, Ga.

June 12-15—National Plant Food Institute annual meeting, Greenbrier

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June 27-29—Pacific Branch, Entomological Society of America, Davenport Hotel, Spokane, Wash.

July 13-15—Eleventh Annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City; B. R. Bertramson, State College of Washington, Pullman, Wash., chairman.

July 27-29—Great Plains Agricultural Council, 1960 meeting, Laramie, Wyo.

## CROP STUNTED

OKLAHOMA CITY, OKLA.—Oklahoma's winter wheat crops and barley and oats have been stunted by the unusually cold November. Extent of the damage has not been assessed. The harvest of row crops is in its final stages.

## INDEX OF ADVERTISERS

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DECEMBER	JANUARY	FEBRUARY	MARCH
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5
6 7 8 9 10 11 12	7 8 9 10 11 12 13	7 8 9 10 11 12 13	6 7 8 9 10 11 12
13 14 15 16 17 18 19	10 11 12 13 14 15 16	14 15 16 17 18 19 20	13 14 15 16 17 18 19
20 21 22 23 24 25 26	17 18 19 20 21 22 23	21 22 23 24 25 26 27	20 21 22 23 24 25 26
27 28 29 30 31	24 25 26 27 28 29 30	28 29	27 28 29 30 31
APRIL	MAY	JUNE	JULY
1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7	1 2 3 4	1 2
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17 18 19 20 21 22 23	15 16 17 18 19 20 21	12 13 14 15 16 17 18	10 11 12 13 14 15 16
24 25 26 27 28 29 30	22 23 24 25 26 27 28	19 20 21 22 23 24 25	17 18 19 20 21 22 23
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AUGUST	SEPTEMBER	OCTOBER	NOVEMBER
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7 8 9 10 11 12 13	4 5 6 7 8 9 10	2 3 4 5 6 7 8	6 7 8 9 10 11 12
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28 29 30 31	25 26 27 28 29 30	23 24 25 26 27 28 29	27 28 29 30
		30 31	

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- Providing feature material designed to help manufacturers and mixers to do a better job, to help dealers sell and to help farm advisors and educational people make sound recommendations.
- Keeping all industry alert to current and proposed government action.
- Providing a channel through which news and advertising can reach all segments of the industry.

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